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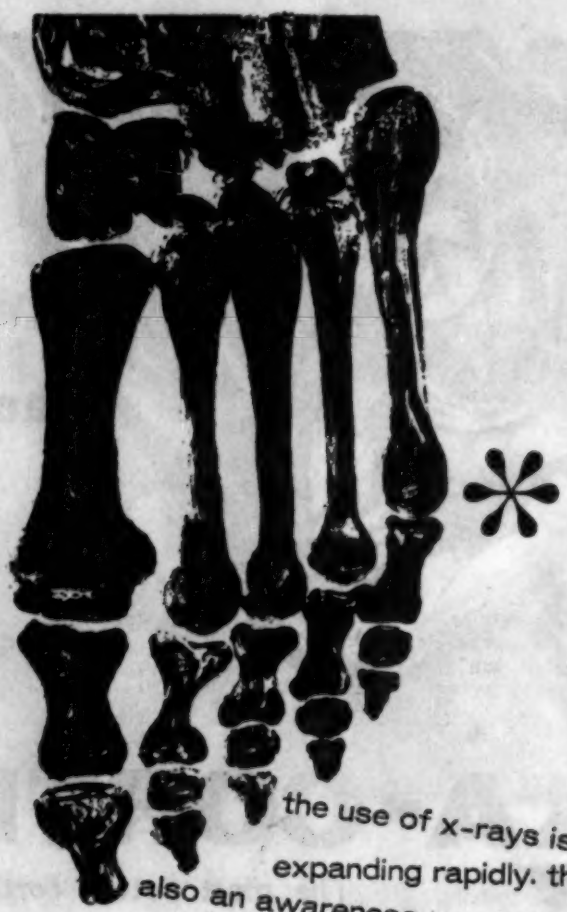

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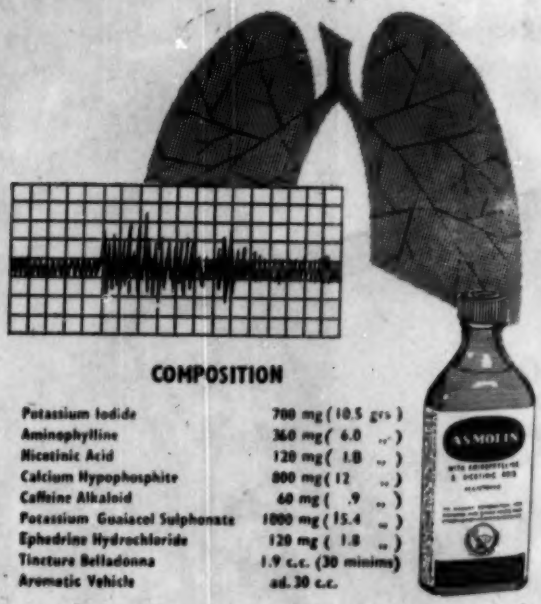

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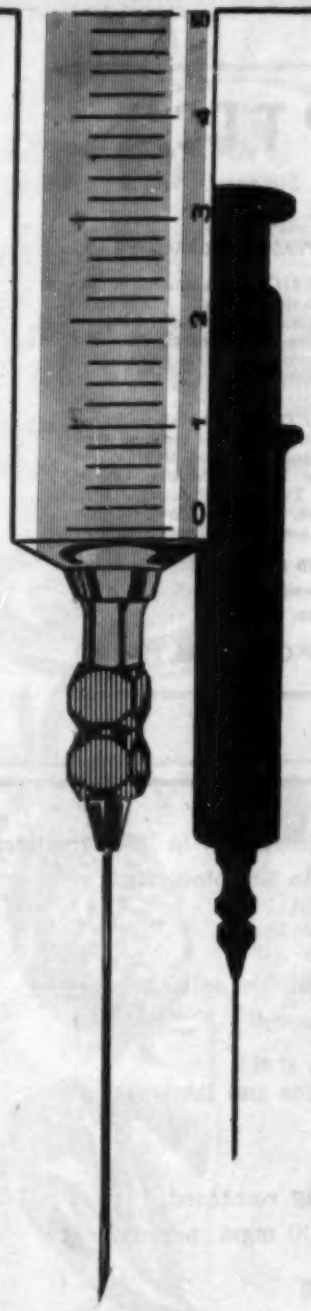

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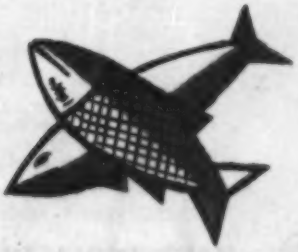

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ORIGINAL ARTICLES

A REVIEW OF 200 CASES OF SNAKE BITE WITH SPECIAL REFERENCE TO THE CORTICOSTEROID THERAPY

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Approximately 25,000 deaths from snake bite accidents occur each year in India (Porges, 1953). Cobra, krait and vipers, principally Russell's viper and Echis, are the commonest types of poisonous terrestrial snakes met with in India and are responsible for practically all the snake bite deaths in the country. Snake venom is a complex agent and its toxic action is mainly dependent on proteolytic enzymes, phosphatidases and neurotoxins. The clinical picture depends on the quantity and quality of the venom injected. Symptoms appear generally within 10 minutes to 2 hours after the bite and nausea, fainting and vomiting are the characteristic early manifestations. Cardiovascular shock follows the colubrine and viperine bites, paretic features predominate in the former and general haemorrhagic manifestations in the latter.

Apart from the treatment with ligation, incision, suction of the wound and supportive measures, immediate antivenin therapy is undoubtedly the only sound and reliable form of treatment of snake poisoning (Schottler, 1952). In addition to the above treatment corticosteroids have recently been tried to hasten the recovery from various local and general symptoms (Hoback and Green, 1953 ; Gowdy, 1954 ; Schottler, 1954). In this paper a brief review of 200 cases of snake bite treated in Irwin Hospital, New Delhi, from 1954 through 1959, is presented with special reference to the use of additional corticosteroids.

CLINICAL OBSERVATIONS

Age incidence—The cases studied were between the ages of 3 and 80 years. The incidence of snake bite in various age groups is given in Table 1.

TABLE 1—SHOWING INCIDENCE OF SNAKE BITE IN VARIOUS AGE GROUPS

	Age (years)				
	1-15	16-30	31-45	46-60	Above 60
No. of cases ...	21	118·0	39	19	3
Percentage ...	10·5	59·0	19·5	9·5	1·5

Sex incidence—164 cases were males and 36 females, the male to female ratio being 9 : 2.

Seasonal incidence—The seasonal incidence of snake bite is greatest during the rainy season. In this series the incidence increased in June, reaching its peak in August. This is well brought out in Table 2.

Site of bite—The various sites of snake bite are given in Table 3. In 32 per cent of the cases bites were inflicted on the fingers and toes, in 48 per cent on the hands and feet and in 20 per cent on the remaining parts of the body. The general impression among the laity is that the bites on the

TABLE 2—SHOWING INCIDENCE OF SNAKE BITE MONTH BY MONTH

Month	No. of cases	Month	No. of cases
January	1	July	31
February	3	August	54
March	10	September	34
April	16	October	17
May	11	November	6
June	15	December	2

TABLE 3—SHOWING SITES OF SNAKE BITE

Site of bite	No. of cases	Site of bite	No. of cases
Fingers	22	Toes	42
Hand	34	Foot	62
Forearm	8	Leg	14
Arm	4	Thigh	6
Neck, head	4	Trunk	4

fingers and the toes are more dangerous than those on the broad and flat surfaces. However, in our series the bites on fingers and toes were not found to be more dangerous.

DIAGNOSIS

The exact type of the snake causing the bite could not be ascertained in all the cases as the snakes were not brought for examination except on 3 occasions. The type of the snake was arrived at mostly by symptoms and signs alone as described by Ahuja and Singh (1954). In the cases of viperine bites the coagulation time of blood exceeds 10 minutes or red blood cells appear in the urine. The colubrine bites are generally very easy to diagnose because of the presence of neurotoxic symptoms. With these criteria 35 (17·5 per cent) cases could be ascribed to viperine bite, 10 (5 per cent) cases to colubrine bite and in 155 (77·5 per cent) cases the bite was either by non-poisonous snakes or the injury by poisonous snakes was not sufficient to produce symptoms of poisoning.

Symptoms and signs—The various symptoms and signs met with in the series are given in Table 4. The neurological manifestations mostly consisted of muscular weakness, blurred speech, inability to swallow, dribbling of saliva, shallow and hurried breathing followed by respiratory failure and even death. The different types of bleeding are given in Table 5.

TABLE 4—SHOWING ANALYSIS OF SYMPTOMS AND SIGNS OF SNAKE BITE

Symptoms and signs	No. of cases	Percentage
Local pain	40	20·0
Giddiness	15	7·5
Drowsiness	8	4·0
Fever	90	45·0
Oedema or cellulitis	26	13·0
Circulatory failure	6	3·0
Neurological signs	10	5·0
Bleeding diathesis	35	17·5
Haemoglobinuria	1	0·5
Gangrene	1	0·5

TABLE 5—SHOWING CASES WITH DIFFERENT TYPES OF BLEEDING

Types of bleeding	No. of cases
Bleeding from the bite-wound	24
Gross haematuria	8
Bleeding from the gums	3
Bleeding from soft palate	2
Purpura	2
Epistaxis	2
Haemoptysis	2
Haematemesis	2
Melaena	1

Investigations—In 35 cases macroscopic or microscopic haematuria was found and the coagulation time varied between 14 and 50 minutes. Of these in 3 cases the bleeding time was also high. It ranged between 6 minutes and 9 minutes, 30 seconds. One of the cases with increased bleeding time had purpuric rashes.

TREATMENT

Ligation or application of tourniquet was used as a first-aid measure in 60 per cent of cases.

Incision of the wound and suction or lavage with potassium permanganate solution was done in all the cases.

A.T.S. was injected in 95 per cent of cases.

Anti-snake venom serum, I.V., in dosage of 10-110 c.c. was given in 91 per cent of the cases. 9 per cent of cases did not receive it as they came

TABLE 6—SHOWING THE RESULTS OF THERAPY IN 2 GROUPS OF CASES

COMPLICATIONS	CASES WITH CORTICOSTEROIDS			CASES WITHOUT CORTICOSTEROIDS		
	Recovery	Mortality	Average stay in hospital (days)	Recovery	Mortality	Average stay in hospital (days)
Bleeding	4	nil	5·1	11	1	9·3
Bleeding with oedema ...	6	nil	6·2	6	1	10·2
Bleeding with circulatory failure ...	4	nil	6·7	2	nil	11·3
Oedema or cellulitis	4	nil	3·0	9	nil	6·3
Neurotoxic symptoms ...	2	nil	7·0	—	nil	—
Total ...	20	nil	5·6	28	2	7·4

2 to 3 days later when there were no symptoms of snake poisoning. 12 patients were found to be sensitive to the anti-snake venom. In 3 cases desensitisation was done. 7 cases developed urticaria in spite of negative skin sensitivity when the dose of antiserum was repeated. Two patients got anaphylactic shock with I.V. anti-snake venom serum but both came round with prompt anti-allergic treatment.

Intravenous fluids were given as and when required. One to four units of blood transfusion were given in 24 patients who developed severe bleeding tendency.

In view of the large number of infected lesions due either to the snake bite or the defective first-aid measures, antibiotics like penicillin were used in 57 per cent of cases.

Symptomatic measures, particularly to allay severe anxiety and pain, were adopted.

Arrangement was made for artificial respiration for cases with neurological signs.

In addition to anti-snake venom injections and the above mentioned routine treatment, some cases with severe local oedema, fever, bleeding disorder and/or neurological manifestations were given cortisone 50-100 mg., I.M., 8 hourly or prednisolone, 5-10 mg., 6 to 8 hourly.

RESULTS OF TREATMENT

Out of the 200 cases of snake bite 11 (5·5 per cent) cases died. 9 of these died within 6 hours of admission and have been excluded on the plea that enough time was not available for effective treatment. 189 (94·5 per cent) cases recovered completely without any sequelae. In 20 cases who had either oedema, fever, bleeding tendency or neurological manifestations, additional corticosteroids were used. The other 30 cases with similar complications were treated with the standard treatment only. The results with the two regimes of therapy are compared in Table 6.

It may be pointed out that in the corticosteroid treated group there was no mortality, the control of bleeding was earlier and the reduction of oedema, fever and pain was quicker than in the group treated without corticosteroids. Further, in the corticosteroid treated cases although repeated injections of anti-snake venom were given there were no allergic reactions, whereas in the other group moderate to severe allergic manifestations appeared in 7 cases.

DISCUSSION

The management of snake bite is a major problem in India. Its danger is related to the season of activity of the snakes. In this part of the country 75·5 per cent of the cases of snake bite fell in the 5-month period from June to October with a peak incidence of 27 per cent in August. This seasonal incidence approximates that reported by Ahuja and Singh (1954) and Wood (1954).

There is, however, a difference between snake bite and snake poisoning. The term snake bite should be reserved for those patients who come with a bite by a poisonous or a non-poisonous snake, whereas the term snake poisoning should be reserved only for cases who show symptoms of envenomation. In this series symptoms of snake poisoning were seen in 45 (22·5 per cent) cases and the overall mortality was 5·5 per cent, the fatal outcome resulted mostly from the colubrine bites. Out of 1,231 cases of snake bite collected from all over India by Ahuja and Singh (1954), 541 (44·7 per cent) bites were inflicted by poisonous snakes with a fatality of 9·5 per cent. In 17·5 per cent of our cases the bite was by viperidae and in 5 per cent by colubridae.

The only effective antidote against snake poisoning available at present consists in the immediate use of specific antiserum (Schottler, 1952). In this series polyvalent anti-snake venom serum which is effective against cobra, common krait, Russell's viper and *Echis carinatus*, was used. It was noted that the control of bleeding and the subsidence of oedema, fever and pain were faster in the group treated with corticosteroid. On the other hand morbidity in the 30 control cases was more pronounced and prolonged. Hoback and Green (1953) and Gowdy (1954) reported on the use of additional cortisone and ACTH, in cases of snake poisoning with very good results.

The beneficial effect of steroids in these patients is obviously due to the inhibition of local tissue reactivity to foreign proteins and the symptomatic effect on pain and fever. Another advantage of corticosteroid therapy is the absence of allergic reaction in cases where repeated doses of antiserum have to be given.

Summary

Two hundred cases of snake bite treated in Irwin Hospital, New Delhi, during the last 6 years are reviewed. 45 (22·5 per cent) cases showed evidence of snake venom poisoning. In 20 of these cases where additional corticosteroids were given there was marked diminution in the morbidity and mortality as compared with the cases who did not receive the corticosteroids. An additional advantage of the drug was found in the inhibition of the allergic reaction occurring with the use of repeated antiserum therapy.

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AN EVALUATION OF MODERN MANAGEMENT OF ECLAMPSIA

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The ideal management of any disease should depend on the discovery of the cause and be based on the elimination of the same. Unfortunately eclampsia is still the disease of unproven theories. The treatment therefore has to be directed towards the management of the symptoms. The rational management should of course include prophylactic measures before the onset of the disease. It has been recently demonstrated in Australia that by prompt treatment of early pre-eclamptic toxaemia of pregnancy, the incidence of eclampsia has been reduced from 1 case in 500 patients, to no case in 5,000 patients (Hamlin, 1952 ; Dawson, 1953).

In 1930 Stroganoff introduced sedatives in the treatment of eclampsia and this he modified later (Stroganoff and Davidovitch, 1937). By and large the two main principles, viz., the reduction of sensitivity of the central nervous system with sedative drugs and the prevention of afferent stimuli from reaching the patients' central nervous system, have become the main core of modern management. This does not differ from what Stroganoff (1930) taught. Different writers have claimed improved results by using different drugs, although the principle of treatment remained exactly the same.

Dewar and Morris (1947), Madhavan and Bhaskar Rao (1955) showed the role of tribromoethanol (avertin) in the management of eclampsia with remarkable improvement. Brown (1950) and Krishna Menon (1953) used intravenous thiopentone with not very promising results. Bryant and Fleming (1940), Assali (1950), Stern and Burnett (1954) used veratrum viride and claimed better results. Aoustin (1953), Baccaglini (1953), Mitra and Dasgupta (1957), Mitra *et al* (1958) used chlorpromazine hydrochloride (largactil) in combination with promethazine hydrochloride (phenergan) and pethidine hydrochloride with remarkable improvement. Subhadra Devi (1959) used tribromoethanol with chlorpromazine hydrochloride (largactil) with some improvement in results. Krishna Menon (1959) used phenothiazine derivative (diparkol) and claimed almost equally good results. Hingson (1949) tried to revolutionise the treatment of eclampsia

TABLE 1—SHOWING SEVERITY OF THE DISEASE IN RELATION TO PARITY, NUMBER OF FITS, BLOOD PRESSURE, OEDEMA AND ALBUMINURIA

Parity	No. of cases	Types	No. of cases	No. of fits	No. of cases	Blood pressure mm. Hg	No. of cases	Oedema No. of cases	Albuminuria No. of cases
Primigravida	43	Antepartum	2	2	3	Systolic :		Absent in 3	Nil in 4 (in all
2nd gravida	6	Intrapartum	46	3	1	120-140	13	(+) in 16	cases appeared
3rd gravida	5	Postpartum	9	4	2	141-160	27	(++) in 27	after the fit)
5th gravida	1			6	1	161-180	14	(+++) in 9	(+) Hazy in 8
7th gravida	1			7	1	181-200	1	Anasarca in 2	(++) Cloudy in
15th gravida	1			8	1	201-220	2		23
				9	1	Diastolic :			Solid on boiling
				12	2	80-100	31		in 22
				14	1	101-120	22		
				Innume-	44	121-140	3		
				rable		141-160	1		

with the use of conduction anaesthesia by the caudal route. But the treatment failed to gain popularity.

In this paper 57 cases of eclampsia, who were admitted in the year 1959 and treated mainly with morphine, magnesium sulphate and paraldehyde, are presented. During the same period, 3347 cases were confined giving an incidence of eclampsia of 1·6 per cent of the admissions. None of the eclampsia cases had antenatal care.

CLINICAL MATERIAL

Almost all the cases were from the low-income group. Out of 57 cases, 43 were primigravidae and, contrary to expectation, 46 cases (80·7 per cent) were of intrapartum eclampsia, 44 cases (77 per cent) were admitted with the history of innumerable fits. In 41 cases the systolic blood pressure was between 141 to 180 mm. Hg. Further details of clinical features are shown in Table 1.

MANAGEMENT

In addition to the routine general management of eclampsia cases, the following regime were followed :

Zero hour—Morphine hydrochloride, gr. ¼, intramuscularly. If the patient had received any form of sedative before admission this part of the treatment was omitted.

1st hour—Magnesium sulphate (20 per cent solution), 25 c.c., intramuscularly.

3rd hour—Calcium gluconate (10 per cent solution), 10 c.c., with glucose (25 per cent solution), 100 c.c., intravenously.

5th hour—Morphine, gr. ¼, intramuscularly.

7th hour—Magnesium sulphate (20 per cent solution), 25 c.c., intramuscularly.

9th hour—4 to 6 drams of paraldehyde in 5 ounces of plain warm water rectally.

In cases where fits continued beyond this period or the patient became constantly restless the following drugs were given :

1. Pethidine hydrocholoride, 25 mg., or chlorpromazine hydrochloride 12·5 mg., glucose (25 per cent solution) 100 c.c. intravenously. The choice of drug depends on the level of the blood pressure at the time of injection.
2. Where the systolic blood pressure was 160 mm. Hg or above, or the diastolic pressure 100 mm. Hg or above and the patient got fits, serpasil, 1 mg., was given intramuscularly and repeated if necessary.
3. Antibiotics were used when indicated.
4. Intravenous atropine gr. 1/300 was given when there was apprehension of pulmonary oedema. If necessary this drug was repeated.

Obstetric management was carried out in the usual conservative way (Table 2). No caesarean section was necessary in any of the cases. Strict antenatal care failed to prevent eclampsia in one case.

TABLE 2—SHOWING OBSTETRIC MANAGEMENT OF 46 CASES

Unaided delivery	Low forceps with or without episiotomy	Craniotomy	Episiotomy
14	23	7	2

Case Report

G.D., aged 21, primigravida, was under strict antenatal care throughout her pregnancy. At the eighteenth week of pregnancy she had pyelitis, which was cured with treatment. During this time she had a trace of albumin and pus cells in her urine. All through her pregnancy she had albumin in her urine and the blood pressure never exceeded 140/90 mm. Hg. Ten days before her expected date, she went into labour, which lasted for just 14 hours, and a healthy living baby was born after a medio-lateral episiotomy. Oedema of the extremities was absent. About 72 hours after her confinement she had an eclamptic fit. During this time her blood pressure was 120/90 mm. Hg and the urine was clear. She was given routine treatment. In all, she had 3 fits. After the second fit albumin (++) appeared in the urine and the blood-pressure rose to 140/90 mm. Hg. The patient had an uneventful recovery.

Maternal Mortality

There were 3 maternal deaths in this series. In one case, the death was due to associated congestive cardiac failure in mitral stenosis and regurgitation. She was severely anaemic and was admitted with hyperpyrexia. She expired within 6 hours of admission.

Discussion

Our knowledge of the mechanism of production of fit in eclampsia is incomplete. External stimulus is the immediate cause of a fit. Theories which account for the convulsions include (1) causation of cerebral anoxia, perhaps due to intracranial vascular spasm, (2) hypertensive encephalopathy, (3) cerebral oedema, caused by an excessive retention of sodium ions and (4) cerebral dysrhythmia. Mackintosh (1952) sought to explain the convulsions in eclampsia as due to an epileptic tendency. Cerebral dysrhythmia refers to a characteristic abnormality of cortical electrical discharge which is shown on an electroencephalogram recording. This type of recording is found in epilepsy. Mackintosh (1952) postulated that a pregnant woman who had severe toxaemia of pregnancy with cerebral dysrhythmia would get eclampsia. But Douglas *et al* (1953) found no relationship of eclampsia with cerebral dysrhythmia. It seems therefore that cerebral dysrhythmia may be so common during pregnancy that its occurrence cannot explain the phenomenon of eclampsia.

The eclamptogenic sequence may be interrupted by various means:

I. THE AVOIDANCE OF STIMULI:

This was first emphasised by Stroganoff in 1924. This is the basis of nursing care in eclampsia. However, it is difficult to eradicate it completely, as for example noise in a busy hospital and the painful uterine contractions.

II. DRUGS:

Two types of drugs are in vogue today for the basic treatment. These are central nervous system depressants and hypotensive drugs. The former are used to reduce the patient's perception of stimuli. This was introduced by Stroganoff.

A. The depressant drugs in common use are: Morphine, magnesium sulphate, tribromoethanol (avertin), chlorpromazine, thiopentone, etc.

B. The hypotensive drugs used are: Veratrum viride, chlorpromazine, etc.

Other methods to reduce cerebral oedema, sodium ion excretion, etc. are in use as adjuvants. The processes are too slow for therapeutic purpose.

Some of these drugs need further discussion:

Tribromoethanol (avertin)—This was employed clinically by Butzengeiger in 1926 as a 'fixed dose' anaesthetic by rectal administration. Dewar and Morris (1947) from Europe and Madhavan and Bhaskar Rao in our country sponsored this drug in the treatment of eclampsia. Being a basal anaesthetic it has a considerable amount of sedative action. The results of treatment shown in Table 3 are not very encouraging as compared with the other methods. Besides there are technical difficulties regarding the selection of dose in each patient. It might cause sloughing of the rectum owing to the presence of dibromvinyl alcohol and tribromacetaldehyde. The usual cause of death with avertin is respiratory paralysis. It is not a volatile agent which is excreted through the lungs. It is advisable not to use avertin unless one is skilled in intubating the trachea. The drug is detoxicated in the liver and excreted through the kidneys. Larger doses in normal persons or smaller amounts in patients with liver disease may cause hepatic damage. In eclampsia the pathological changes in the liver are well described. The literature on death from tribromoethanol intoxication, including the report of a case of yellow atrophy of the liver with toxic nephrosis has been reviewed by Anderson (1945). Tribromoethanol may cause albuminuria and frank renal injury if used in patients with renal disease. Roughly speaking the bad effect of this drug in eclampsia is comparable to that of chloroform which is not now used.

Chlorpromazine hydrochloride (*largactil*)—This drug was synthesised in France in 1950 and in 1951 it was used for the first time in Paris for artificial hybernation. It has certain advantages. Courvoisier *et al* (1953) have described amazingly

TABLE 3—SHOWING COMPARATIVE RESULTS OF TREATMENT OF VARIOUS AUTHORS WITH THE PRESENT SERIES

Authors	Year	No. of cases	Drugs used	Maternal mortality %	Foetal and neonatal deaths %
Brown	1950	26	Pentothal I.V.	7·6	33·0
Dewar and Morris ...	1947	45	Bromethol	6·7	37·8
Krishna Menon	1950	78	Chlorpromazine & diparkol	3·8	2·5
Krishna Menon	1953	75	Pentothal I.V.	16·0	40·0
Madhavan and Bhaskar Rao	1955	130	Bromethol	5·4	11·2
Mitra and Dasgupta ...	1957	133	Largactil & phenergan	4·5	39·0
Mitra, Bhose and Dey ...	1958	125	Largactil & phenergan	Nil	16·0
Stern and Burnett	1954	80	Veratrone	2·5	27·5
Subhadra Devi	1958	74	Chlorpromazine & bromethol	Gross— 12 Corrected— 5·4	Perinatal deaths %: Premature—56 Term— 22
Present series	1959	57	Morphine, mag. sulph. etc.	Gross— 5·2 Corrected— *3·5	†Gross— 47 Corrected— 8

* One case of double mitral lesion with failure excluded.

† 38 per cent admitted with absent foetal heart sounds.

large number of actions of this preparation (hence the name largactil) manifested by the drug including gangliolytic, adrenolytic, antifibrilatory, anti-oedema, antipyretic, anti-shock, anticonvulsant, and anti-emetic properties. Chlorpromazine was found to enhance the potency of a number of analgesic and central depressant drugs and to disrupt conditioned reflex. The mode of action is not yet certain. Both the behavioural and E.E.G. changes induced by the drug resemble those observed in monkeys with chronic interruption of the medial ascending paths from the reticular formation concerned with arousal and wakefulness (Das *et al*, 1954). Mitra and Dasgupta (1955), Mitra *et al* (1958), Krishna Menon (1959) used this drug extensively in eclampsia. The excellent results published by them are shown in Table 3.

At the same time other workers did not get the same good results by using this drug in eclampsia. From the published papers on largactil and phenergan treatment of eclampsia and from the personal experience gained by one of us, while working in a Unit where these drugs have given a very good result, several points are evident. The very low maternal mortality appears to be due mainly to the prevention of shock, and pulmonary and other complications. In many cases control of fits was not very satisfactory by this treatment, although the ultimate result was good. The usefulness of the drugs in lowering the blood pressure was found satisfactory in most of the cases. But in certain cases, there was sudden and considerable fall of blood pressure, while in others, the drugs failed to lower the level of the blood pressure. In quite a number of cases, puerperal psychosis developed within a few days. In view of these, and until these highly satisfactory results are confirmed by different workers, it will remain unsettled whether better nursing care and antibiotics or the drugs themselves are responsible for the result.

However there is still considerable indecision about the use of this drug in obstetrics. It has been emphasised that in non-malignant conditions one must assess whether the benefits likely to be obtained by the use of this drug are such as to outweigh the side-effects associated with its use. This drug has been viewed from two angles, namely, general and obstetrical. Serious complications like thrombocytopenic purpura and agranulocytosis (sometimes fatal) have been reported (Cohen, 1955, Hodges and Lazerte, 1955; Lewis and Sawicky, 1955; Marley, 1955, Tasker, 1955). The drug has a direct effect on the heart and myocardial depression may occur after any dosage exceeding as little as 100 mg. a day (Dobkin and Gilbert, 1954). The severe hypotensive effect of chlorpromazine may be refractory and on occasions may be absolute (McCormik, 1955; Moore and Bridenbaugh, 1956). Sometimes the effect may be unpredictable and its action cannot be correlated with dosage (Easten and Li, 1957). Liver damage following the administration of chlorpromazine is probably far more common than is

suspected. It has been said to be responsible for 1 in 10 of jaundice in general hospital patients (Graham, 1957). Females are more susceptible than the males (Isaacs, MacArthur and Taylor, 1955). The onset of jaundice may only appear sometimes after the administration of the drug has ceased (Isaac *et al*, 1955, Benaim and Coppen, 1958).

The liver damage takes the form of an intrahepatic cholestasis without extrahepatic biliary obstruction. The biochemical picture simulates obstructive type of jaundice and on many occasions has led to an unnecessary exploratory laparotomy. Even liver damage may be shown to occur without the appearance of clinical jaundice (Bartholemew and Cain, 1956, Dundee, 1957).

In obstetrics, the drug slows down labour not only in multiparae and those with poor uterine contractions but also in primiparae and results in increase of forceps rates by about four times. Postpartum haemorrhage has followed uterine inertia thus produced (Browne and Mannion, 1955).

Veratrum viride—From time to time some obsolete drug is re-examined in the laboratory for its potential therapeutic usefulness. The use of veratrum viride in eclampsia dates from 1859. This drug acts mainly by producing hypotension, and its effect is a complex one and not completely understood. Its use results in a fall of blood pressure, and bradycardia. The hypotension results from peripheral vasodilatation. The contributory role of the medullary centres and of the carotid sinus, carotid body and ganglion in veratrum induced fall of blood pressure and bradycardia is disputed. The neural pathways for the efferent vasodilator discharge remain to be determined. Bryant and Fleming (1940) aroused interest in the use of the drug in eclampsia. They used the intramuscular route. Not being satisfied, Assali (1950) used the drug by intravenous route. The margin of safety between the therapeutic and the toxic dose is very narrow. It is impossible to obtain therapeutic action without producing any side effect. The chief side effects are nausea, vomiting, sweating, salivation, hiccough, epigastric and substernal burning, blurring of vision and mental confusion. More recent reports on the use of veratrone are given by Bryant (1948) who treated 168 cases with 3 maternal deaths. Barker *et al* (1950) treated 198 cases with three maternal deaths and Stern and Burnett (1954) treated 80 cases with two maternal deaths (Tables 3 and 4). Veratrum is a hypotensive drug, and may be used for that purpose. But in eclampsia the production of fit is not only due to the high blood pressure but is due to a complexity of factors. It is not unusual to find that a patient with unrecordable blood pressure is having innumerable fits. The results of treatment compared by Stern and Burnett may be encouraging but the popularity of this type of treatment has waned.

TABLE 4—SHOWING RESULTS OF TREATMENT OF ECLAMPSIA (STERN & BURNETT, 1954)

Methods of treatment		No. of cases	Maternal mortality per cent	Perinatal death per cent
Sedative	...	1,071	7·56	29·2
Bromethanol	...	149	4·03	32·6
Veratrone	...	498	1·8	28·5

SUMMARY AND CONCLUSIONS

57 cases of eclampsia treated with modified Stroganoff's method have been presented, and the results have been compared with those obtained by other methods. Various drugs in use have been discussed.

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PHENYLBUTAZONE IN THE TREATMENT OF SOME REACTIVE AND PAINFUL COMPLICATIONS OF LEPROSY

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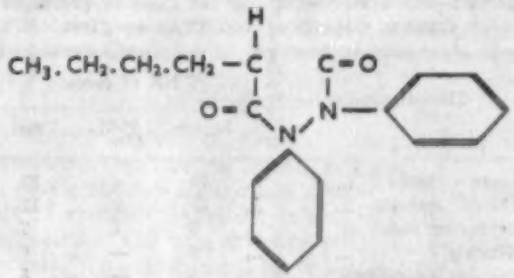
INTRODUCTION

Phenylbutazone, a pyrazole derivative, was first synthesised in the laboratories of J. R. Geigy S A Basle, Switzerland, in 1946. Chemically it is a 3, 5 dioxo 1, 2 diphenyl-4-n-butylpyrazolidin.

Originally it was used in combination with aminopyrine under the trade name 'irgapyrine'. When used alone it is significantly less toxic than 'irgapyrine'. Phenylbutazone has been widely used as an analgesic, antipyretic and anti-inflammatory agent in a wide variety of diseases. Currie (1952) obtained successful results with phenylbutazone in the treatment of fibrositis. Since then several reports have been published on its efficacy in rheumatoid arthritis, rheumatic fever, rheumatoid spondylitis, gout, osteoarthritis, thrombophlebitis, etc. The drug resembles cortisone in that both are analgesic, anti-inflammatory and produce salt retention oedema. Following the reports of successful use of phenylbutazone in various diseases an investigation was undertaken to find out its efficacy in some of the reactive and painful complications of leprosy.



STRUCTURAL FORMULA OF PHENYLBUTAZONE

MATERIAL AND METHOD

Of 52 patients treated with butazolidin (phenylbutazone—Giegy) for various clinical conditions (Table 1), 46 were lepromatous and 6 were dimorphous types of leprosy. All leprosy patients had been under treatment either with D.D.S. or sulphetrone or thiosemicarbazone. There were 44 men, 6 women and 2 children. All the patients were admitted into the hospital and were under continuous medical observation during and after the treatment. Patients with renal, cardiac and gastro-intestinal complications were not selected for the study.

Total and differential counts of W.B.C., haemoglobin estimation and total count of R.B.C. were done.

Urine was examined for albumin, sugar, bile salts and pigments and also microscopically.

Of the 52 cases, 30 were put on butazolidin tablets and 22 on injections. The dosage schedule of the tablets was 800 mg. a day, in 4 divided doses, for three days, and then 400 mg. a day for another one or two days. In most of the cases the treatment was discontinued after the fourth day. The intramuscular injection was given in the following schedule: 600 mg. a day for the first three days, and then 300 mg. a day for another one or two days.

TABLE 1—SHOWING ANALYSIS OF THE CASES IN DIFFERENT CLINICAL CONDITIONS AND TYPES OF CASES

Clinical conditions	No. of cases		
	Severe	Mild	Total
Acute arthritis	16	4	20
Chronic arthritis	10	2	12
Erythema nodosum ...	6	1	7
Neuritis	6	—	6
Burning sensation ...	5	—	5
Thrombophlebitis	1	1	2

RESULTS

During treatment with butazolidin the patients were examined daily and their progress recorded. The clinical response to the drug is shown in Table 2. This grading of progress, as clarified below, was done according to the remission of symptoms and signs, and the activity of the disease was not taken into consideration. Excellent response means complete remission of symptoms and signs at the end of the treatment ; Good response means major improvement ; Fair response means minor improvement ; Poor response means no improvement.

TABLE 2—SHOWING CLINICAL RESPONSE TO BUTAZOLIDIN

Clinical conditions	Results of treatment				
	Excellent	Good	Fair	Poor	Total
Acute arthritis ...	15	2	3	—	20
Chronic arthritis ...	7	3	—	2	12
Erythema nodosum	3	—	1	3	7
Neuritis	1	3	—	2	6
Burning sensation ...	3	1	1	—	5
Thrombophleb.tis ...	2	—	—	—	2
Total ...	31	9	5	7	52

Acute arthritis—The actual pathology of acute arthritis in leprosy is not clear but clinically it is very similar to rheumatic arthritis. Of the 20 cases 6 had effusion in the knee joints. The joints usually involved were knees, elbows, ankles and the small joints of fingers in that order. In all the cases the drug was administered for four days only.

Chronic arthritis—This is quite often associated with generalised lepra reaction. All the patients in the group have had previously intravenous injection of potassium antimony tartrate or mercurochrome or camoquin. In five cases a maintenance dose of 200 mg. a day was given for a week. Three of the five patients improved at the end of the treatment. The other two developed salt retention oedema.

Erythema nodosum—Three of the cases failed to improve and ultimately potassium antimony tartrate was given to bring down the reaction.

Neuritis—Of the nerves involved in six cases, 5 were ulnar and one was median. In two cases stripping had to be done to relieve the pain.

Burning sensation—This complication which is due to the irritation of the nerve terminals is quite a disturbing condition and very often patients do not get much relief from P.A.T. or mercurochrome. All the cases showed response to the drug.

Thrombophlebitis—This occurs as a secondary complication during dimorphous reaction when there is swelling and ulceration of the extremities.

TOXICITY

Side-reactions occurred only in four patients, two of them had salt retention oedema which disappeared after discontinuing the drug and putting the patients on to a salt-free diet. One patient had mild jaundice which disappeared ten days after stopping the drug. One patient complained of giddiness and this also cleared up after four days. There were no severe side reactions. There was slight reduction in the total W.B.C. counts but none of the patients showed any reduction below normal. There was no significant change in the haemoglobin or R.B.C. counts.

DISCUSSION

Lepra reaction is not a favourable complication and when it occurs often it prolongs the course of the disease. Intravenous potassium antimony tartrate is still the effective drug in controlling lepra reaction, but the outpatients find it very difficult to attend on alternate days for the injection. From the results we find that the response to both oral and parenteral therapy is more or less the same. For leprosy outpatients oral administration of butazolidin is preferred for its simplicity. Kuzell *et al* (1957) feels that parenteral administration brings about quicker remission of symptoms, and Kidd (1953) claims no gastro-intestinal complications when butazolidin is administered by injection. Many of the side reactions could be avoided by careful selection of the patients and administration of the drug in low doses. Jesting *et al* (1958) who treated 180 patients with low doses of butazolidin for periods upto three years found side reactions only in 27 cases and out of these only three were of some importance. The authors

advocate further trial of this drug in reactive and painful complications of leprosy.

Summary

52 patients were treated with butazolidin for various reactive and painful complications of leprosy.

The dosage schedule was (a) Orally 800 mg. per day in four divided doses, for three days, and 400 mg. per day for another one or two days; (b) Parenterally 600 mg. per day for three days, and then 300 mg. per day for another one or two days.

In chronic cases a maintenance dose of 200 mg. daily by mouth may be given.

Only seven cases failed to show any improvement.

Mild side reactions were seen in four cases and these disappeared after discontinuing the drug.

Acknowledgment

Our thanks are due to Suhrid Geigy Trading Private (India) Ltd. for their generous supply of the drug and also for making all the literature on butazolidin available to us. Our thanks are also due to the colleagues who helped us in carrying out this investigation.

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CLINICAL EVALUATION OF A NEW IMIDAZOLINE VASOCONSTRICTOR

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Among the aromatic imidazoline derivatives, a number of vaso-active substances (both constrictor and dilator) have been studied. 'Privine' is perhaps the most widely known constrictor and 'otrivin' (BA-11-391) is a similar product. Chemically, 'privine', is naphthyl-methylimidazoline hydrochloride and 'otrivin' is 2-(4-tetrabutyl-2, 6-dimethylbenzyl)-2-imidazoline hydrochloride.

Toxicity

Acute toxicity of 'otrivin' compared with adrenaline (mg./kg.) is shown in Table 1:

Toxic effects were those of sympathetic stimulation including mydriasis, pilomotor excitation, tachycardia, and hypertension, persisting for long periods. One-tenth the acute toxic dose by whatever route was well tolerated and repeated daily for 16 days in rabbits. On the other hand, one-fourth the acute lethal dose given daily proved fatal to half the experimental animals within sixteen days. In this latter group, morphologic changes were noted in the kidneys consisting chiefly of hyperaemia and oedematous swelling. Microscopic examination of the spleen, heart, adrenals, intestines and stomach revealed no pathological changes.

Circulatory system—An elevation of blood pressure was noted with doses of 1-3 μg./kg. intravenously in dogs, cats and rabits without the secondary decrease in pressure often seen after adrenaline. As would be expected, the hypertensive effect of adrenaline was augmented by BA-11-391, but in contrast to adrenaline, BA-11-391 increased the renal blood flow. BA-11-391 in absolute terms was less active than adrenaline or noradrenaline in these experiments.

In the spinal (cervical section) animal 'otrivin' was found to be just as effective in raising the blood pressure markedly over a long period. This may be taken as an indication of its peripheral site of action.

Clinical trial of the drug in the relief of nasal congestion was carried out in the E.N.T. outpatients department of the Chittaranjan Hospital attached to the Calcutta National Medical College Group of Hospitals.

Selection of Patients

The patients selected belonged to two main groups:

1. Allergic—Patients in this group exhibited symptoms of allergy in the shape of fits of sneezing, watery discharge, and nasal obstruction of varying degrees with pale oedematous nasal mucosa. Actual hypertrophy was excluded by spraying with 2 per cent ephedrine or 1 in 1000 adrenaline. Presence of chronic infection was excluded by radiological examination.

2. Allergy combined with evidence of chronic infection—confirmed radiologically in every case.

TABLE 1—SHOWING ACUTE TOXICITY OF OTRIVIN AND ADRENALINE

Test animal	Intravenous		Subcutaneous		Oral	
	BA—11-391	Adrenaline	BA—11-391	Adrenaline	BA—11-391	Adrenaline
Mouse	40	1	75	10	230	...
Rabbit	3	6	18	10	70	...

INVESTIGATIONS

The following investigations were carried out in each case, viz., (1) differential count of blood, (2) skiagram of the paranasal sinus, (3) examination of the nasal secretion for eosinophilia.

Total number of cases investigated was 96. The subjects were selected at random—some having been seen for the first time and others being chronic cases previously treated with other drugs. They were observed for a period of 6 months, from May to October, 1959.

METHODS OF TREATMENT

Patients were instructed to put 5 drops of otrivin into each nostril with the head extended and to gently sniff it up the nose 3 times a day to begin with, but were advised to put the drops more frequently if they found the relief inadequate. In the follow-up the patients were asked to attend once a week and although some patients failed to keep the regular interval, a majority of them were seen once a week and no patient had more than 15 days' gap in the follow-up. They are asked to use the other nasal decongestants, i.e., 5 per cent protargol and 1 per cent ephedrine in normal saline, which are in routine use in this hospital, for a period and their comments regarding the difference in the relief obtained were noted. The objective findings in the shape of subsidence of the oedematus condition of the nasal mucosa were also noted.

The results are given in Table 2.

FIG. 2—SHOWING COMPARATIVE RESULTS OF TREATMENT WITH OTRIVIN AND OTHER DECONGESTANTS

Group	No. of cases	Relief obtained with otrivin			Relief obtained as compared to other decongestants	Objective findings	Duration of medication (weeks)	Recurrence
		Marked	Moderate	None				
Group I (Allergic Cases)	52	35	14	3	Greater and more sustained except in 7 cases who had transitory relief. Better relief with protargol or ephedrine	Oedema of mucous membrane markedly reduced after one week	1—3	2 to 3 times in 30 per cent of cases, but again relieved by medication
Group II (Infective Cases)	44	28	11	5		Took longer time	2—4	Once in about 30 per cent of cases, twice in about 10 per cent of cases. Relieved by re-application and wash out

Side Effects

The study emphasised the remarkable absence of any side effect. Only 3 patients complained of a sense of irritation just after application of the drug, the irritation being transitory.

Summary

Otrivin was given a clinical trial in 96 cases and the patients were observed for 6 months. The relief obtained was good and sustained in the majority of cases, although a very small number reported that they obtained better relief with other decongestants.

There was a remarkable absence of side effects during treatment with this drug.

One per cent solution of otrivin was found to be the optimum strength. Patients using 0·5 per cent solution complained that the effects were transitory.

Application of the medicine 3 times a day was found to be effective in most cases. About 15 per cent of cases said that they had to use it oftener, i.e., 4 times a day and once or twice at night for the 1st week, after which the improvement was maintained with application 3 times a day.

One remarkable factor which came out during the investigation was that except in 6 cases there was a marked absence of eosinophil cells in the nasal secretion which was examined as a routine in all cases.

Conclusion

Otrivin is likely to prove a valuable addition to our armamentarium in the treatment of nasal congestion. A 1 per cent solution is the optimum strength and application 3 times a day is generally effective in maintaining the relief.

Acknowledgment

Our thanks are due to Messrs. Ciba Pharma Ltd. for supplying the drug and giving the hospital a grant to conduct the study.

The pharmacological assay of the drug (BA-11-391, Otrivin) was not done in this hospital but the data incorporated in this article were supplied to us by Messrs. Ciba Pharma Ltd.

Our thanks are also due to Dr. M. N. Sarkar, Superintendent, C.N.M.I. Group of Hospitals for permission to use the hospital material, records and data for publication.

PRACTITIONERS' SERIES

AMOEBIASIS AND AMOEBICIDES

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Amoebiasis is one of the problem diseases of our country. In spite of a fairly comprehensive knowledge of the pathogen and the pathogenesis of this disease, it has not been possible for us to find out a suitable remedy uptil now.

Historical

One of the earliest references about dysentery and its treatment with *Holarrhena antidysenterica* may be found in the Bower manuscript of Ayurvedic texts. The writings of Hippocrates dating between the 4th and the 5th century are very rich in the description of dysenteric states. The actual discoverer of amoebic dysentery is considered to be Loesch. He in 1875 first described the amoebae in a typical case.

The *in vivo* experiments were initiated by Kartolis with cats in 1891. The rat test, as we use now, was first devised by Lynch in 1915. Dobell carried out tests with the monkey in 1929. Since *Entamoeba histolytica*, the causative agent of amoebic dysentery thrives only in the presence of commensals, it was very difficult to obtain a pure culture of amoebae *in vitro*. The first successful culture of *E. histolytica in vitro* was made by Boeck and Drobohlav in 1925.

Clinical

The clinical manifestations of the disease are multiple and varied. It must be remembered that dysentery is only a part of the syndrome, and the common idea among the clinicians that the term amoebiasis is synonymous with 'amoebic dysentery' is erroneous. In fact "A vast majority of infections is not accompanied by dysenteric symptoms but by much milder symptoms attributed to some other factor and not recognised as the result of the infection with the parasite".

Cases of amoebiasis may be clinically divided under the following heads: (A) Intestinal and (B) extra-intestinal. Each of these can be sub-divided into several distinct and definite clinical entities.

Intestinal amoebiasis is discussed under the heads of (i) acute or chronic dysentery or diarrhoea, (ii) syndromic cases, (iii) asyndromic infection, (iv) asymptomatic infection including particularly the

healthy carriers, and (v) complications of amoebiasis. The disease may sometimes assume such definite and circumscribed symptomatology that the complications of this disease are sometimes considered as entirely distinct clinical subheads.

The extra-intestinal group may, in its turn, be subdivided into (i) hepatomegaly in association with colonic amoebiasis, (ii) amoebic hepatitis, (iii) amoebic liver abscess, (iv) visceral amoebiasis, and (v) cuticular amoebiasis.

The disease as classified above, comprises of several much too well-known clinical entities and in this article, these groups will not be discussed.

The non-dysenteric intestinal amoebiasis presents a complex symptomatology. There may be vague pain in the abdomen, abdominal distension, chronic diarrhoea or constipation, or alternate diarrhoea and constipation, ill-defined and ill-localised pain in the body particularly in the back and loins, low grade pyrexia or syndromes simulating chronic appendicitis, chronic cholecystitis or even peptic ulcer. Mention must also be made of personality changes accompanying chronic intestinal amoebiasis. There may be irritability of temper, headache, partial impotence and insomnia. Frequently, multiple vitamin deficiency accompanies the disease because of altered digestive functions. Fatigue, nervousness, slight pyrexia added with the objective sign of hepatobiliary dysfunction strongly indicate that the entire syndrome is one of intestinal amoebiasis. All these symptoms and signs may be caused by a variety of diseases but the identification of the parasite in the faeces and the response to amoebicidal drugs will clarify the problem.

Sometimes, fever is the only symptom in a fair percentage of cases. The fever is low-grade and intermittent in type, often accompanied by chill and rigor. Such cases are mostly treated by the physicians as cases of pyrexia of unknown aetiology. These patients are often given a course of chloroquine, the provisional diagnosis being malaria and the fever subsides for the time being only to recur again.

Patients with symptoms simulating either appendicitis, cholecystitis or peptic ulcer usually in the acute form fall under the category of syndromic cases. In some cases, there may be symptoms of subacute intestinal obstruction simulating abdominal tuberculosis and in a very small percentage of cases, there may be a palpable mass on the left side of the abdomen to give the appearance of a new growth. Only through the routine laboratory examinations it is possible to arrive at the correct diagnosis of such a case.

Patients with chronic intestinal amoebiasis who do not manifest the classical symptoms of the disease are usually termed asyndromic cases. The patients themselves do not feel any gross illness. But usually they have exaggerated gastrocolic reflex and feel an urge to defaecate shortly after meals. Their bowel movement is irregular, and they suffer from alternate diarrhoea and constipation. Other symptoms include anorexia, flatulence and vague pain in the abdomen. But from the pathological point of view, some degree of ulceration of the intestinal mucosa is always present in the different groups of amoebic patients.

Patients of the asymptomatic group do not exhibit any sign of active ulceration of the large gut. They act as storehouse of the cystic forms of *Entamoeba histolytica* which are responsible for the dissemination of the disease in the community. The patient possibly develops an immunity which results in a symbiosis between the parasite and the host. Pathologically, only minute ulcerations are seen in the intestine, or even there may be a solitary punched out ulcer in the caecum. Hence, there is no intestinal symptom of any importance. But the indirect evidences of chronic intestinal amoebiasis are invariably present. In so far as the patient himself is concerned, the potential danger lies in his developing amoebic hepatitis or even amoebic hepatic abscess.

There has not been much difference of opinion in so far as the intestinal group of amoebiasis is concerned. But authorities have differed considerably in describing the internal pathology of the liver involvements in amoebiasis. Though in our classification, we have included three types of hepatic involvement in amoebiasis, in considering this aspect of the problem in more detail, we will be considering them together.

Liver involvement in amoebiasis—Of these three types of liver involvement, amoebic liver abscess is known from the time of Hippocrates and the association of liver abscess with amoebic dysentery is known from the time of Galen. Koch found the trophozoites of *E. histolytica* in the liver abscess of a man in 1885. The pathology of liver abscess is known in all the details and there is no scope of difference of opinion about it, the only point to be stressed is that in spite of the huge necrotic mass no secondary organisms are to be found in the amoebic hepatic abscess. This makes emetine the drug of choice for this condition.

But the entire picture is still confusing with regard to other types of amoebic hepatitis, and there are all shades of opinion among clinicians and pathologists, some of whom even deny the existence of diffuse lesions in the liver in amoebiasis.

The evidence in favour of or against the existence of amoebic hepatitis may be grouped under the following heads:

(1) Autopsy studies—A review of the available literature shows that most of the investigators observed small areas of centrilobular necrosis in the liver with infiltration of lymphocytes, histocytes and monocytes. There is slight lymphoid hyperplasia of the portal tract. Not rarely *E. histolytica* trophozoites are seen in the sinusoids at the periphery of the necrotic area. But there are also a few reports where the investigators failed to find any diffuse hepatic lesion due to *E. histolytica* in any of their cases.

(2) Liver biopsy studies—This has been preferred, as the autopsy studies may not give a true picture of the tissue changes. The most important changes observed by the majority of workers, have been lymphocyte and plasma-cell infiltration in the periportal areas and rarely some increase in polymorphonuclear cells. Indian workers have noted an increase in the reticulo-endothelial cells. No amoebae have been found by any investigator. According to some workers these evidences are diagnostic of amoebic hepatitis.

(3) Liver function tests—These tests have been carried out to assess the amount of hepatic damage in amoebiasis. Of the different tests employed, Takata-Ara tests, Quick's hippuric acid test, estimation of serum alkaline phosphatase, serum cholinesterase activity, estimation of transaminase level (both S.G.O.T. and S.G.P.T.) have been undertaken. All these investigations have revealed that there is a significant lowering of the activity of liver in amoebic hepatitis, and this change is reversible, the hepatic efficiency improving with anti-amoebic treatment.

From the perusal of the literature, it can be concluded that there is some degree of hepatic involvement in a large majority of cases of amoebiasis and that there are three stages of liver involvement in this disease.

(i) Early hepatitis or pre-hepatitis—This is manifested by slight enlargement of the liver, and minimal or no constitutional disturbances such as fever, leucocytosis, etc. This stage is the most common of all forms of hepatic amoebiasis and occurs in more than 50 per cent of the cases of intestinal amoebiasis.

(ii) A definite amoebic hepatitis—Hepatomegaly and constitutional disturbances are present in these cases.

(iii) Amoebic liver abscess—This occurs only in a small number of cases of amoebiasis.

Pulmonary amoebiasis—Clinically, pulmonary amoebiasis is one of the most common forms of metastatic visceral amoebiasis. It may be primary or secondary. In primary pulmonary amoebiasis, *E. histolytica* gains entrance in the portal circulation through the intestinal wall and then *via* the portal circulation into the pulmonary capillaries. The resulting abscess may be single or multiple. Multiple small abscesses scattered over a considerable area of the lung field simulate clinically and radiographically, the exudative type of tuberculous lesion of the lung. But primary pulmonary amoebiasis is a rare condition and in the majority of cases so far reported, the diagnosis has been possible only after the failure of the usual tuberculostatic therapy.

When an amoebic hepatic abscess bursts into the base of the right lung, it gives rise to one form of secondary pulmonary amoebiasis. The necrotic liver tissue and blood is coughed out and hence the colour of the sputum is 'anchovy-sauce' (reddish brown). A liver abscess may also burst into the plural cavity leading to empyema. A serous effusion in the plural sac has often been observed in association with an abscess in the subdiaphragmatic part of the right lobe of the liver. Infection of the lung tissue may also occur from direct extension of the liver abscess through adhesions formed with the diaphragm, the liver and the base of the liver of the right lung.

In pulmonary amoebiasis emetine is the drug of choice.

Cutaneous amoebiasis—Skin ulcerations may be caused by amoebic invasion of the skin and was first noted in a case of spontaneously ruptured liver abscess. It is most commonly met with in the perianal region, the skin adjoining the area of drainage of liver abscess or a colostomy wound. There may be extensive necrosis and sloughing of the skin and subcutaneous tissue. These ulcers respond well to emetine therapy.

Treatment of Amoebiasis

The treatment of amoebiasis is beset with several problems. Whenever the environment turns hostile to the continuance of its life encystment of the vegetative form takes place. The cysts are practically nonvulnerable to drugs. The symbiosis of *E. histolytica* with some of the intestinal flora is another problem. There are drugs which act indirectly on the amoebae by being toxic to the symbiotic organisms. There are many drugs which produce a gross alteration on the intestinal flora, and they cannot therefore be utilised as amoebicides. The frequent accompaniment of giardiasis is another problem.

However, the search for newer amoebicides has been undertaken by research workers all over the

world. It may not be out of place here to devote a few lines on the general method used to screen the drugs, produced by chemists either empirically or following a definite structural pattern. The methods are the same as used by workers all over the world. In the *in vitro* tests, the amoebae are suspended in a suitable medium (Balamuth's egg yolk infusion liver extract) in glass tubes containing suitable concentrations of the new compounds. Then they are incubated at 37°C for 24 to 48 hours. The deposit at the bottom of the tubes is then examined microscopically for any living amoebae.

For the *in vivo* tests, in the Central Drug Research Institute we use the 'rat method'. Young rats are anaesthetised, their caeca are brought to the surface through a slit in the abdomen. Then a suspension of amoebae (50,000 to 100,000 in 0·5 ml.) is injected into the caecum and the wound is repaired. The rats are orally treated with the unknown compound for 5 days starting on the day after the operation. Seven days after the operation the rats are sacrificed and the caeca of the treated rats are compared with those of infected but untreated controls. It is expected that in the controls the lesions will be severe, the wall of the caecum much thickened and ulcerated, the caeca full of mucus without any faeces and many amoebae present in the contents and scrapings from the wall. If the findings in the treated group give any suggestion of activity, the compound is tested again to confirm or negative the suggestion.

The interpretation of the results of these tests is very difficult and it is commonly seen that a compound having strong amoebicidal effect *in vivo* is without any effect on man.

After carefully studying the structural formula of emetine a variety of compounds essentially diamines in nature have been synthesised and in our Institute the most active compounds appeared to have a central chain of 9 carbon atoms with morpholine as a substituent on one side and a hexyl or dodecylamine, the N being secondary, on the other side. The *in vitro* activity of a compound also depends upon the distance of the two nitrogen atoms. This led us on to the structural alteration of cinchona bases. It was seen that desoxyhexahydroquinine which is structurally similar to emetine has a powerful *in vivo* amoebicidal effect and is far less toxic than emetine.

Turning now to the available amoebicides, we may classify them as follows:

A. Natural products:

Ipecacuanha, holarrhena, etc.
Antibiotics.

B. Synthetic products.

C. Organic arsenicals:

Trivalent and pentavalent compounds.

D. Diloxamide.

Amoebicides may also be classified according to their site of action as follows:

A. Drugs which act systematically:

Emetine, carbarsone, etc.

B. Drugs which act only in the intestine:

Antibiotics, chiniofon, di-iodo-hydroxyquinoline, etc.

C. Drugs selectively concentrated in the liver:

Choroquine, emetine.

NATURAL PRODUCTS:

Emetine is an alkaloid obtained from the roots of *Cephaelis ipecacuanha*. It is used as a subcutaneous, intramuscular or local injection of emetine hydrochloride and by mouth in enteric-coated capsules as emetine bismuth iodide. The local injections are usually given in the (amoebic) abscess cavity of liver after aspiration of the necrotic material. When given parenterally, emetine is concentrated by the liver, lungs, spleen and kidneys but not by the intestine or striated muscles.

Emetine is the drug of choice in the treatment of amoebic abscess of the liver and other organs. In amoebic dysentery, it is most effective in the treatment of acute cases. It should not be used when the symptoms are mild. It has no value in the treatment of carriers. It does not bring about a radical cure in more than a small proportion of cases but it does effectively suppress the symptoms of the disease. It has a direct toxic action upon the amoebae but has no effect on the cysts. The dose of emetine usually employed is 30 mg. twice daily for not longer than 10 to 12 days. Children are given proportionately smaller doses.

Emetine is a toxic substance. The toxic effects may appear with a therapeutic dose of 60 to 65 mg. of the hydrochloride daily by subcutaneous or intramuscular route. Therefore careful selection of cases and close medical supervision are necessary for emetine therapy. One of the schemes to avoid the toxic effects is that since dysentery responds to two or three injections of emetine, the remaining amoebae can be destroyed by means of another drug. However, as a general rule, the patient should be kept in bed during and sometime after treatment with emetine. Larger doses (of the order of 120 to 180 mg. per day) may cause serious poisoning and death. Symptoms of emetine

poisoning include muscle pain and weakness, nausea, vomiting, abdominal pain, diarrhoea, fever, oedema, purpura and urticaria. The most dangerous effects are however on the heart. It has a direct toxic action on the myocardium, causing hypotension, precordial pain, tachycardia and dyspnoea. E.E.G. abnormalities may also appear and in severe poisoning there may be heart failure and death.

Emetine bismuth iodide—It is used orally to treat amoebic dysentery in which the dysentery has been controlled by injections of emetine. It may sound curious, but still it is a more potent amoebicide than parenteral emetine, though its activity appears to be primarily due to its emetine content. It is insoluble in acid gastric juice and is liberated only when it reaches the alkaline intestinal juices. Toxic effects are similar to those associated with parenteral emetine. Nausea, vomiting and diarrhoea are frequent but not serious if the drug is given before sleeping and together with a sedative.

Holarrhena antidysenterica—It is known in Sanskrit as 'Indrajav' or 'Kutaja' but is commonly known as Kurchi. In the ayurvedic medicine its bark was used either as a powder or a watery extract. The emulsion of the seeds were also used. The main alkaloid of this plant is conessine. Parenteral conessine in a daily dose of 1 to 2 gr. for 10 days is not as effective as the powdered bark or the watery extract. But the injections of total alkaloids in uncomplicated cases of amoebic dysentery cause the vegetative forms of amoebae to disappear rapidly. They do not reappear as a rule. Total alkaloids were also given by mouth and there was no resulting nausea or vomiting.

After primary clinical observations with *Holarrhena* by Acton and Chopra in 1933, French scientists became interested with these alkaloids. Canet treated amoebiasis with conessine hydrochloride, conessine hydrobromide and the total extracts and noted that the total extracts were therapeutically more efficacious and gave fewer toxic effects than the salts. Signier *et al* reported that 50 per cent of emetine resistant cases were cured with conessine hydrochloride.

The main advantage of conessine over emetine is that it may be administered orally.

Kurchi-bismuth-iodide—This double salt was prepared by Acton and Chopra. When sufficiently large doses are given, it reaches the large intestine in a sufficient concentration to destroy amoebae. The standard method of treatment is to administer the bismuthous iodide compound of the total alkaloids in 10 gr. (0·6 g.) doses, twice daily for 10 to 20 days, preceded half an hour before by a mixture containing one drachm of sodium bicarbonate and 40 gr. of sodium citrate. In obstinate and persistent cases, the standard extract of kurchi, 1 to 2 drachms daily, with or without *Isabgul* for a prolonged period (1 to 3 months) is often effective. The extract is extremely bitter to taste.

Among the other plant principles used in the treatment of amoebiasis, mention may be made of *Simaruba glauca, Brucea sumatrana, Stephania rotunda, S. hernandifolia* and *Anemone chinensis.*

Antibiotics—These are used to treat secondary infections of amoebic abscess and the primary disease itself. Chlortetracycline and oxytetracycline are effective in intestinal amoebiasis, but chloramphenicol, penicillin and streptomycin appear to have little value. Success was obtained with chlortetracycline hydrochloride (aureomycin) in about 75 per cent of the patients in Korea. Given along with chloroquine there were no failures in 23 patients. But it is impossible to arrive at any definite conclusion with such a small number of cases. It is administered in capsules, in daily doses of 1 to 4 g. The maintenance dose in chronic infections may be as low as 50 mg., 4 times daily (0·2 g.). The toxic effects include nausea, vomiting and diarrhoea during or shortly after commencement of the therapy. The diarrhoea is due, at least in part, to changes in the intestinal flora. Inhibition of normal bacterial flora may lead to dangerous overcapacity of Monilia and yeast-like invaders specially in the lungs and skin. It also increases the number of *Trichomonas intestinalis* in the faeces.

Oxytetracycline (terramycin) appears considerably more effective than chlortetracycline or chloramphenicol in the treatment of acute amoebic dysentery. The daily dose is 1·5 to 3 g. divided into four doses. Terramycin often produces gastrointestinal disturbances but they are less severe than those produced by chlortetracycline. The effect of this drug on the intestinal flora may equally lead to moniliasis.

Fumagillin is a crystalline substance and inhibits the metabolic activity of amoebae. It is, therefore, a very effective agent against amoebiasis. But it often produces striking side effects and these may include desquamation of the palms and feet. It may also produce leucopenia.

Fumagillin is produced by the mould *Aspergillus fumigatus.*

It has been suggested that the amoebicidal activity of chlortetracycline and oxytetracycline is not due to a direct toxic action on the *E. histoly-*

tica but to the destruction of the bacterial flora producing metabolites for its establishment, growth and development. Reference has already been made to these flora as symbionts of *E. histolytica*. Chlortetracycline has also a direct amoebicidal effect.

These antibiotics being effective only on the trophozoites of *E. histolytica*, the combination of an antibiotic with an anticystic drug should be ideal. It must also be remembered that a direct amoebicidal antibiotic when combined with an indirect amoebicide gives a definitely better result.

SYNTHETIC PRODUCTS :

Emetine analogues—We have already mentioned about desoxyhexahydroquinine.

Chloroquine—This drug is preferred to emetine because of its lower toxicity. It is mainly used in the treatment of amoebic hepatitis. Its specificity against *E. histolytica* in liver is due to the concentration and possibly its metabolism in that organ. It is of little value in the treatment of intestinal amoebiasis. In amoebic hepatitis it is preferably combined with a drug which is active on the intestinal forms (carbarsone, chiniofon). The dose is 0·3 g. thrice daily for four days, followed by the same dose once a day for 2 to 3 weeks. Side effects are not serious but there may be headache, visual disturbances, gastric upset and pruritus.

Diiodohydroxyquinoline (5: 7-di-iodo-8-hydroxyquinoline)—It is used to treat symptom-free carriers and also cases of chronic intestinal amoebiasis. In acute cases, emetine or carbarsone may be given in conjunction with diiodohydroxyquinoline. The dose usually given is 0·3 to 0·6 g., three or four times a day for three weeks. Although this compound contains from 62 to 64 per cent of iodine, it seems that the amoebicidal activity is dependent on the 8-hydroxyquinoline nucleus and not on iodine. Iodine may lower the solubility of the drug and increase its effectiveness. The side effects include gastro-intestinal upset, headache and pruritus. Because of its higher iodine content, it should be used cautiously in cases of thyroid dysfunction and also in patients who are hypersensitive to iodine.

The opinion that the effectiveness of diiodohydroxyquinoline is independent of its iodine content is not universally held. Some authorities claim that iodine is the chief amoebicidal component of the drug. Hence there have been more than one iodine containing amoebicidal compounds.

Iodochlorhydroxyquinoline (5-chlor-7-iodo-8-hydroxyquinoline)—It is used in the ambulant treatment of chronic intestinal amoebiasis. A combination of iodochlorhydroxyquinoline with para-stearyl-aminophenyl-trimethyl-ammonium sulphomethylate—a dispersing agent, is also available. The dose of iodochlorhydroxyquinoline is 0·25 to 0·5 g. three times a day for ten days. After a rest period of 7 to 10 days this schedule is repeated. Its toxicity is low but it may cause diarrhoea and gastric upset.

Chiniofon—It is a mixture of 7-iodo-8-hydroxyquinoline-5-sulphonic acid with sodium bicarbonate. It is used in the treatment of chronic intestinal amoebic dysentery. It is of no value in other forms of the disease. The dose is 1·0 g. two to three times daily for 7 to 10 days and the course may be repeated, if necessary, after a rest period of a week. It may also be used in the form of a retention enema (200 ml. of a 1 per cent solution in 2 per cent sodium bicarbonate for five to seven nights). Toxic effects which are infrequent may include nausea, intestinal colic, diarrhoea and headache.

ORGANIC ARSENICALS :

Carbarsone—It is effective in the treatment of carriers and of chronic intestinal amoebiasis. Its effectiveness may depend upon its inhibitor action upon thiol-enzymes. Usually 0·25 g. 2 to 3 times a day is given for 7 to 10 days. This course may be repeated after a rest period of 10 days. The side effects are the same as those of any other arsenical and include nausea vomiting, diarrhoea, skin rashes and damage to the liver and kidney.

Glycobiarsol—It is also used in the treatment of chronic intestinal amoebiasis. The recommended dose is 0·5 g. thrice daily for 7 days. Acetarsone and thiocarbarsone have also been used in the treatment of intestinal amoebiasis. Acetarsone is more toxic than carbarsone.

There are some newer arsenicals and time has not yet come to evaluate them.

Diloxanide (Dichloracet-4-hydroxy-N-methylanilide)—It is one of the newer amoebicidal agents. It has a specific action on the cysts of *E. histolytica* but is less effective against the vegetative form. Therefore, it is mainly used in chronic intestinal amoebiasis. The effective adult dose is 1·5 g. per day for a minimum period of 10 days. It is of low toxicity, is cheap and is relatively free from side effects.

Entobex—This is 4, 7-phenanthrolinequinone. The biological characteristics of entobex as determined by Kradolfer and Niep, are as follows :

(a) The *in vitro* activity is at least equal or superior to that of emetine.

(*b*) It has strong bacteriostatic properties. It is an effective trichomonicidal drug, being 8 times more active than emetine.

(*c*) In rats, the minimum effective dose (100 per cent cure) is 50 mg./kg. The ratio of effective dose to toxic dose is 1 : 100, i.e., 30 times greater than with emetine.

(*d*) It is excreted in the urine and in the bile in an amoebicidal form. Chemical analysis indicates that the drug is at least partly metabolised in the organism.

(*e*) Curiously enough, inspite of its antibacterial properties, it causes an increase in the number of coliform bacilli in the faeces of rats treated with it. But the urine of the treated animals displays a bacteriostatic action on the same coliform bacilli. This may indicate that the activity of such a compound is governed by some special conditions of the intestine.

Summary and Conclusions

An attempt has been made in this paper to present concisely some important clinical and pathological aspects of amoebiasis and a short review of the available amoebicides has been made. A short account of what is being done in the Central Drug Research Institute at Lucknow has also been incorporated. It is not yet possible to state that an ideal drug for the treatment of chronic amoebiasis has yet been found, though systematic attempts and more precise screening methods have yielded very encouraging results. There is reason to hope that in the not too distant future the medical practitioner will be able to put his hands on to a really efficacious amoebicidal drug which will enable him to treat quite a large group of his day-to-day patients with vague gastro-intestinal symptoms ranging anywhere from simple gas formation and abdominal distensive discomfort to loose stools with or without blood alternating with constipation and indigestion. Chronic amoebiasis is a slow, insidious and debilitating condition with occasional acute exacerbations and as such is likely to be neglected by the patient. Experimental production in laboratory rats of typical amoebic ulcers in the intestinal tract has played a very useful tool in the hands of medical research workers for doing something more concrete in the field of drug therapy than was possible before. Let us hope that intensive progress will continue in this field and the tropical areas of the world including India would be benefited by newer and more effective amoebic chemotherapy.

SPECIAL ARTICLE

HUMAN AMNION CELLS : THEIR PREPARATION AND USE IN VIROLOGY

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The introduction of cells cultured *in vitro* has revolutionised the study of viruses. With cell lines propagated in tubes and bottles, numerous viruses, some hitherto unknown, have been isolated. Viral vaccines, like those for prevention of poliomyelitis and adenovirus infections, have been made possible through monkey kidney cell cultures. With the aid of cultured cells neutralising antibodies in serum can be estimated quantitatively. They also form a practical source of complement-fixing antigens for serological tests in viral infections.

Among the various lines of cells, those obtained from the human amnion have been of great use. The human placenta, the source of these cells, is easy to procure. Preparation of cells from the amniotic membrane is a comparatively easy procedure. Unlike monkey kidney cells, these are not easily destroyed by trypsin. Some of the wild viruses, occasionally encountered in monkey kidney cells, are notably absent in amnion cells. Their broad spectrum of viral sensitivity is an added advantage. Strains of human amnion cells which have been passaged repeatedly to form stable cell lines are also being used in the isolation and identification of several viruses. The volume of literature on amnion cells is adequate evidence of the wide uses to which these cells are being put to. Some workers claim them to be superior to HeLa and fibroblastic cells for the isolation of ECHO and some respiratory viruses (Table 1).

Table 1—Showing Range of Susceptibility of Cultured Cells to Viruses

Type of virus	Type of cells		
	Monkey kidney	HeLa	Human amnion
Polio 1, 2 & 3	+	+	+
Coxsackie B1 to B5 ...	+	±	±
Coxsackie A9	+	−	+
ECHO 1, 3, 5, 6 & 9 ...	+	−	+
Adenoviruses 1 to 8 ...	±	+	+
Herpes	−	+	+
Western equine encephalitis	−	+	+

Materials

Glassware—One of the essential requirements for successful cell culture is glassware of good quality. Index glass (Sigcol) is satisfactory for this purpose. The next need is a satisfactory process of cleaning and sterilising the glassware. The tubes, bottles, pipettes, syringes, etc., used in this procedure should be scrupulously clean and free from metallic ions. The water used for preparing solutions should be double distilled or distilled and deionised. When water is passed through a column of ion-exchange resin which absorbs all anions and cations, deionised water is obtained. The glasware is scrubbed, cleaned and boiled in a detergent solution (Hemosol and Microsolv are satisfactory) ; washed several times in tap water and immersed in 10 per cent solution of 'Analar' hydrochloric acid ; after rinsing in tap water the articles are successively immersed in distilled water and distilled deionised water. After removal from distilled deionised water, they are dried, and then sterilised in a hot air oven at 160°C for 1½ hours. All glassware used in culturing cells should be carefully processed.

Media—The compositions of the solutions and media commonly used in cell culture are detailed hereunder :

BALANCED SALT SOLUTION (GRAMS PER LITRE) :

	Earle's	Hanks'
NaCl	6·80	8·00
KCl	0·40	0·40
$CaCl_2$	0·20	0·14
$MgSO_4.7H_2O$ ...	0·20	0·10
$MgCl_2.6H_2O$ ...	...	0·10
$NaH_2PO_4.H_2O$ ...	0·125	...
$Na_2HPO_4.12H_2O$ ...	...	0·06
KH_2PO_4	...	0·06
Glucose	1·00	1·00
Phenol red	0·02	0·02
$NaHCO_3$	2·20	0·35

The solution can be autoclaved at 10 lb. pressure for 10 minutes, without glucose and sodium bicarbonate. Balanced salt solutions are conveniently prepared in ten times concentrated strength and diluted with double distilled water at the time of use, and autoclaved.

PHOSPHATE BUFFERED SALINE (PBS) (GRAMS PER LITRE) :

NaCl	8
KCl	0·2
$Na_2HPO_4.12H_2O$	1·15
KH_2PO_4	0·2
$CaCl_2$	0·1
$MgCl_2$	0·1

This solution is also sterilised by autoclaving at 10 lb. pressure for 10 minutes in two parts ; the first four ingredients in one solution and the last two in a second solution and then mixing them together.

GROWTH MEDIUM FOR HUMAN AMNION CELLS :

Hanks' BSS	65 ml.
5 per cent lactalbumin hydrolysate	10 ml. in Hanks'
2 per cent yeast extract ...	5 ml. in Hanks'
Pooled human adult serum	20 ml.

TRYPSIN SOLUTION :

Trypsin (1/250) Difco	1·5 g.
Phosphate buffered saline	600 ml.

Dissolve preferably by stirring with a magnetic stirrer ; Seitz filter and store frozen or at 0°C.

STREPTOMYCIN AND PENICILLIN SOLUTION :

Two million units of penicillin G and 1 g. of streptomycin are dissolved in 16 ml. of sterile double distilled water.

0·4 ml. of this added to 100 ml. of medium, PBS, trypsin solution, etc., gives a strength of 500 units of penicillin/ml. and 250 µg. of streptomycin/ml.

Placenta—Placenta is obtained in a specially prepared large beaker or similar glass vessel containing 300 ml. of phosphate buffered saline (PBS) with penicillin, streptomycin and mycostatin. Crystalline mycostatin for cell culture should only be used. Care is taken to transfer the placenta directly from the birth canal into the glass container. Antiseptics are avoided. Though viable cells have been obtained from placentae processed 14 hours after delivery, it is better to get them as fresh as possible, not later than four hours. The glass container and the placenta are transported in a closed sterile, enamelled iron bin, or similar vessel.

Method

Separation and preparation of membrane—In the laboratory, the placenta is lifted out of the container by a Kocher forceps gripping near the placental end of the umbilical cord, and hung on a stand inside a sterile (irradiated) cabinet. Sometimes on receipt at the laboratory, the amnion is found separated from the chorion. It is easier to strip the amonion, by starting from the placental end of the umbilical cord. The separated pieces of amniotic membrane are placed in a beaker containing 50 ml. of PBS with antibiotics. After removing the amnion, the placenta is discarded.

The blod clots and debris are cleaned off the membrane, which is cut into smaller pieces about 2-5 cm. square, and transferred to a fresh beaker containing PBS. The pieces of tissue are washed a third time in PBS.

Trypsinisation—The pieces of membrane are transferred into a 500 ml. trypsinisation flask (an Erlenmeyer flask with four indentations on its sides and a delivery spout on one side) containing about 150 ml. of 0·25 per cent trypsin in PBS with antibiotics. The pH of the trypsin solution is adjusted to 7·8 by the addition of normal NaOH. The trypsin solution is warmed by keeping it in a water bath at 37°C. A glass-coated magnetic bar, about 2 cm. in length, kept sterile in 70 per cent alcohol, is introduced into the flask after burning away the alcohol. The flask is placed over a magnetic stirrer and stirred for 20 minutes at a low speed.

The contents of the flask are poured into a 250-ml. beaker from which the pieces of membrane and the magnetic bar are transferred into a second trypsinisation flask with 150 ml. of fresh trypsin. The first trypsin extract, which contains red cells and cytotoxic factors, is discarded.

In the second flask, the membranes are stirred at low speed for four periods of 20 minutes each, using about 150 ml. of prewarmed (37°C) trypsin for each extraction. After each stirring, the pieces of membrane are allowed to settle before decanting the supernatant. The trypsin extract is filtered into 250-ml. centrifuge bottles through a double layer of sterile gauze. Some workers have been successful in trypsinising amnion without using a magnetic stirrer (Ferguson and Tobin, 1958 ; Weinstein *et al*, 1956).

Washing and distribution of cells—The pooled, filtered trypsin extract is centrifuged at 1000 RPM for 10 minutes, preferably in 250-ml. bottles and the supernatant is discarded. In a 50-ml. centrifuge tube, the cell deposit is collected to which is added 35 ml. of Hanks' BSS with antibiotics. This is centrifuged at 1000 RPM for 5 minutes and the supernatant is thrown away. The deposit is then suspended in about 10 to 12 ml. of growth medium and transferred into a 15-ml. graduated centrifuge tube. The packed cells, which may vary from 0·5 to 1·5 ml. per placenta, are suspended in about 70 ml. of growth medium. Cells are counted with the help of a Neubauer counting chamber. Counting is facilitated by adding 0·1 per cent solution of trypan blue. The volume is adjusted so as to give 7×10^5 cells/ml.

This is then distributed in 16 × 125 mm. tubes at 1 ml./tube or in bottles at 10 ml./100 ml. bottle. The tubes and bottles are tightly stoppered with rubber stoppers and kept in racks in the stationary position in an incubator at 37°C for 48 hours. After that, the nutrient medium is changed and the tubes are incubated for 3 to 5 days. The fluid, when it has become too acid, has to be changed with fresh growth medium. In about 7 to 10 days a good sheet of cells is usually formed.

Factors Affecting Successful Cultivation

Form our experience with human amnion cell cultures extending over three years, the following factors seem to be the most important for a successful culture:

1. The careful preparation of glassware.
2. The aseptic collection of a fresh placenta.
3. The quality of trypsin.
4. The number of cells/ml. If the cell concentration is less than 3×10^5/ml., it is difficult to obtain a sheet. In places where placentae are readily available, it may be advantageous to process the amniotic membrane from two placentae at the same time. The labour and material required will be about the same but the yield will be double. A packed volume of 1 ml. of cells can give about 150—200 tubes of amnion cells. Occasionally contaminations with bacteria or fungi can hinder the growth of cells.

Uses

Tubes, which show good sheets after a week's growth, are washed with PBS three times to remove all trace of human serum contained in the growth medium. Material prepared for virus isolation, like cerebrospinal fluid, throat gargles, prepared faecal extracts, etc., can now be introduced on the cell sheet in varying amounts (0·1—0·5 ml., depending on the toxic nature of the material) followed by 0·9—0·5 ml. of maintenance medium. These tubes have to be observed under the low power of the microscope every other day for a period of at least 14 days to detect cytopathogenic changes indicating the presence of a virus.

If any tube shows changes caused by viruses, the procedures for identification of the virus, like serum neutralisation or complement fixation tests, are carried out on the material. Frequently second and third passages from a positive tube are carried out to raise the virus titre of the fluid.

Permanent preparations of normal and infected cell sheets can be obtained on sterile, thin coverglasses, 22 mm. × 7 mm., by inserting them in bottles or tubes at the time of starting the cell cultures. As the coverslips adhere to the inner surface of the culture vessel, they can be periodically examined under the low power of the microscope. At appropriate intervals, each coverslip is

taken out, washed gently in PBS, fixed in Bouin's fluid, stained with hematoxylin and eosin and mounted on a slide.

A few microphotographs of coverslip preparations are presented (Figs. 1-6, *vide* Plate). The normal cell sheet shows cells of varying shapes, mostly polygonal, with lightly staining cytoplasm and deeply staining nucleus. Under the high power, nucleoli are seen ; some cells may show mitosis. A cell sheet infected with type 7 adenovirus shows foci of rounded and shrunken cells. Later these foci enlarge to become much larger vacant areas. This effect is known as cytopathogenic effect. Adenovirus infected cells reveal intranuclear and cytoplasmic inclusion bodies under the high power. Cells infected with polio virus show cytopathogenic effect very rapidly. measles virus is characterised by the formation of multinucleated giant cells.

Summary

A method for the cultivation of human amnion cells is described. The factors essential for successful cultivation of cells as well as their uses are indicated.

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CASE NOTES

BRONCHOGENIC CARCINOMA IN AN EIGHTEEN YEAR OLD BOY

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During the last 50 years bronchogenic carcinoma has changed from a 'curiosity' to one of the most frequent cancers in western countries, and Ochsner *et al* (1960), in an extensive review of the literature, present impressive evidence to support the aetiological significance of smoking, especially cigarette smoking to this explosive increase in its incidence. In India, the problem of lung cancer is of lesser magnitude, possibly because, though tobacco is used extensively, cigarette smoking is neither widespread nor heavy. On the other hand, the inadequate medical facilities and the virtual absence of postmortem examinations may to a great extent be responsible for the apparent rarity of this disease as the majority of cases remain undiagnosed. For instance, in Bombay where medical facilities are adequate, Moos (1960) could find 42 cases of lung cancer out of a total of 375 malignant neoplasms from the 2 year (1955-1957) records of the Sir J. J. Group of Hospitals, Bombay.

Most cases of lung cancer occur in the 40 to 60 year age-group. The tumour is extremely uncommon in the young and Hanbury (1958) reporting 3 cases could find only 60 previously recorded cases of bronchogenic carcinoma in persons below 21 years of age. The rarity of the disease in the young and the current interest in bronchogenic carcinoma prompts us to publish the following case.

Case Report

P.B.P., Hindu, male, aged 18, was admitted to the S.S.G. Hospital, Baroda, with pain in the chest for the last five months, cough, occasional in the beginning but persistent during the last month prior to admission, and dyspnoea of four days' duration.

On examination, the patient was seen to be severely dyspnoeic and in acute distress. Pitting oedema was present over the left arm and over the left upper thorax. The patient expired suddenly a few hours after admission. Only a partial postmortem (thorax) examination was permitted by the relatives.

Autopsy examination—A massive haemorrhagic pleural effusion was present on the left side. A firm nodular mass about 3 cm. in diameter was present in the left hilar region. The left upper mainstem bronchus showed thickening and roughening of the mucosa. The surrounding lung showed a diffuse infiltration, its borders merging imperceptibly into the normal lung parenchyma. The gross appearance was not striking as no definite tumour was seen and the infiltration resembled early consolidation.

Histological examination showed the lung and hilar lymphnodes extensively infiltrated by sheets of polyhedral tumour cells. The tumour was generally undifferentiated but in many regions papillary and glandular patterns could be identified. The tumour showed extensive areas of necrosis. The bronchial mucosa showed widespread infiltra-

tion by small groups of tumour cells (Fig. 1, *vide*, Plate) which, though generally lying below the lining epithelium, were at places seen replacing it.

Discussion

Bronchogenic carcinoma is rapidly coming to occupy the position of the most common malignant neoplasm. This frightening increase, however, is restricted to the epidermoid variety and the frequency of adenocarcinomas appears more or less unchanged. The latter are more common in the young and show an equal distribution between the sexes (Anderson *et al*, 1954). The smoking of cigarettes does not bear the same aetiological significance as it does in the epidermoid variety and it has been postulated that these tumours arise from embryonic rests (Graham quoted by Ochsner *et al*, 1952). This also explains the decrease in the frequency of these tumours with advancing age.

The site of origin and the gross appearance of the tumour herein described are somewhat unusual. Bronchogenic carcinomas in the young are usually clearcut circumscribed growths almost always situated at the periphery of the lung (Anderson *et al*, 1954). In the present case the tumour was at the hilum, apparently arising from a large bronchus and so diffuse and ill-defined that it was brought to our notice largely due to the prominent hilar lymph node involvement.

The short duration of symptoms of only five months in our case is consistent with the generally worse prognosis and shorter duration of the disease in adenocarcinoma as compared to epidermoid carcinoma.

Bronchogenic carcinomas in the young are prone to early and widespread metastases (Dick and Miller, 1946; Hanbury 1958). Since only a partial necropsy was performed in this case the presence and extent of metastases could not be established.

Summary

A case of bronchogenic carcinoma (adenocarcinoma type) occurring in a young man, 18 years of age, is discussed.

Acknowledgment

We are grateful to Dr. J. D. Pathak, Dean, Medical College, Baroda, for permission to publish this case.

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BILATERAL TUBERCULOSIS OF THE HIP

BHARAT BHUSHAN, B.Sc., M.D., D.M.R.E.

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Gandhi Medical College, Bhopal, M.P.

Introduction

Tuberculosis of the hip joint is by no means a rare disease. Its frequent occurrence in children tempts one to be so dogmatic as to say: "A hip joint affliction in children is tuberculous unless proved otherwise". The pathology and course of the disease usually confirm the usual text-book description. In rare cases, departure from the usual pattern is met with. The author came across one such case with peculiar radiological features on account of unusual pathodynamic changes.

The disease commonly begins either at the Babcock's triangle or at the posterosuperior part of the acetabulum. The typical pathological changes observed in the disease are: 1. Generalised osteoporosis; 2. Loss of bone pattern and 3. Gross destruction.

The entire course of the disease is conveniently divided into the classical four stages.

Stage 1—The disease is limited to synovial membrane. The limb is held in flexion, abduction and external rotation, with apparent shortening.

Stage 2—The bone is eroded and converted into tuberculous granulation tissue. The nerves are exposed, their irritation causing muscle spasm. Partly this spasm and partly the tilting of the pelvis towards the sound side lead to flexion, adduction and internal rotation with apparent shortening.

Stage 3—Destruction of the acetabulum as well as the head leads to disorganisation of the joint which under the strain of weight-bearing precipitates dislocation of the hip; the so-called 'travelling acetabulum'. The resulting deformity is flexion, adduction, internal rotation with true shortening of the limb.

Stage 4—Ankylosis results. It is usually fibrous in adults and ordinarily bony in children, if happily, the disease comes to be arrested. The resultant deformity is the same as in stage 3 with limitation of all movements.

Case Report

S. S., Hindu, male, aged 15, resident of Sanchi, Bhopal, came under observation on 31-10-56.

Clinically, this was a case of advanced bilateral tuberculosis of the hip. A boy of average build, he had no manifestations of tuberculous toxaemia, nor any clinical evidence of any other tuberculous focus in the body.

Three years back he suffered from smallpox. After one month, he developed a cold abscess on the right thigh which burst and spontaneously healed. One month after, he developed a discharg-

ing sinus in the left buttock and another on the left trochanteric region.

Family history was of no significance.

On examination the patient was found to have fixed flexion deformity of both hip joints. Both lower limbs were flexed, adducted and internally rotated—the right more so.

All movements were extremely restricted on both sides and painful.

The patient had a scar on the lateral side of the right thigh, two sinuses over the left trochanteric region and one sinus on the right side, one inch from the anal opening.

Radiogram of the hip joint presented features (Fig. 1, *vide* Plate) as enumerated below:

1. Advanced bilateral tuberculosis of the hip joints with gross bilateral destruction of the femoral neck.

2. The disappearance of the head of the femur (left side).

3. Prolongation of osteoporosis and loss of pattern over the proximal end of the femoral shaft, bilaterally.

4. Destruction and disorganisation of the acetabulum on both sides.

5. Bilateral dislocation of the joint.

6. Destruction of the acetabular cup on the right side with spiculation and displacement of bony fragments medially into the pelvic cavity.

7. Separation, migration and upside-down position of the head of the right femur inside the pelvic cavity (extraperitoneally) with preservation of shape and form and comparatively less involvement in the diffuse process of destruction.

8. A generalised rarefaction of the components of the pelvic girdle.

Discussion

Rarefaction, destruction, and disorganisation with subsequent dislocation is the rule in the natural history of tuberculosis of the hip. The departure from the usual pattern is the intrapelvic displacement of the separated head which unusually maintains its natural features of shape and density in its new abnormal environment. Presumably, it is due to the fact of its being driven out of the site of the pathological fight between bacteria and bone at an early stage to a remote safer intrapelvic site. This must have happened on account of early involvement of the acetabular cup and its disorganisation much before the involvement of the head. The former, as a natural corollary, must have given way to the capital pressure, the latter simultaneously parting company with the trochanters and rest of the bone on account of disorganisation of the neck. Which joint was the first to get involved cannot be established from the history.

Summary

An unusual case of bilateral tuberculosis of the hip joint has been described.

The case presented bilateral dislocation.

The right femoral head had migrated into the pelvis with a somersault after entering through the acetabular hole resulting from spiculation of acetabular component, like a window being thrown open against the pressing head.

Acknowledgment

My thanks are due to R. P. Singh, our Principal, for kind permission to report this case.

XXXVII ALL-INDIA MEDICAL CONFERENCE :: CHANGE OF VENUE

The Central Council of the Indian Medical Association at its Special Requisition Meeting held at Delhi on October 9, 1960 has decided to hold the 37th All-India Medical Conference at a place outside the State of Assam. The Central Council, I.M.A., at the same meeting empowered the President and the Hony. General Secretary to select the venue and the date for the 37th All-India Medical Conference.

PROPOSED I.M.A. STUDY TOUR OF U.S.A. ABANDONED

The Hony. General Secretary, Indian Medical Association, informs all members who wished to participate in the proposed Study Tour of U.S.A. and Japan of 1960 that as the Reserve Bank of India could not release the necessary foreign exchange, the proposed tour cannot take place and is cancelled.

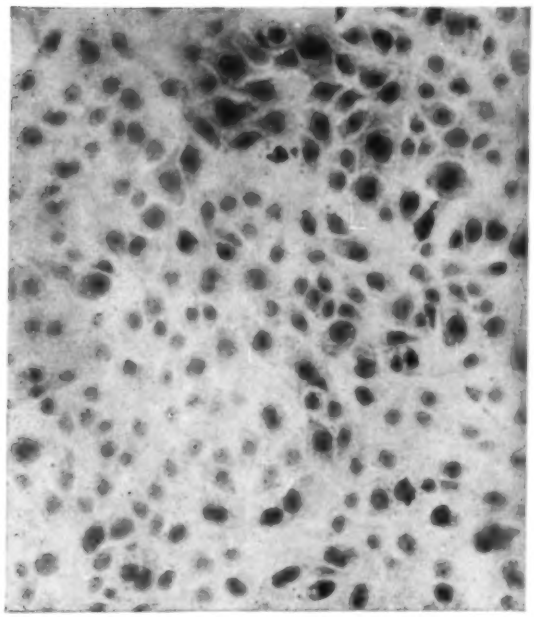

Fig. 1—Microphotograph showing normal human amnion cells (low power)

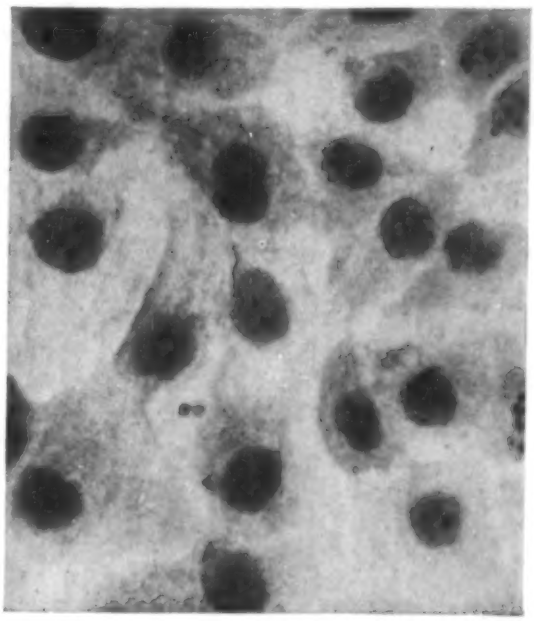

Fig. 2—Microphotograph showing normal human amnion cells (high power)

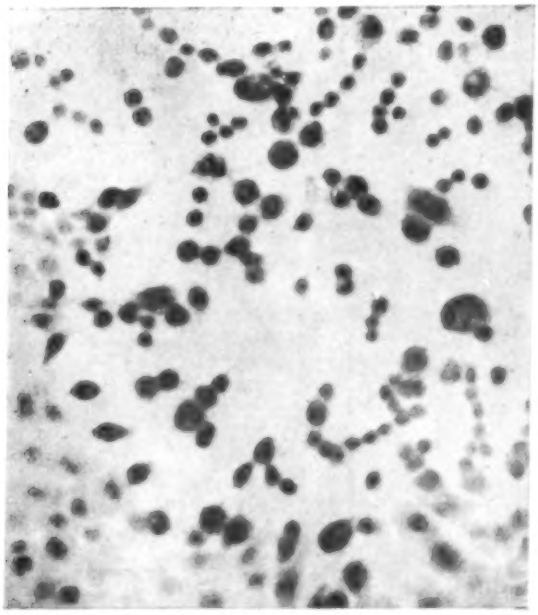

Fig. 3—Microphotograph showing amnion cells infected with type 7 adenovirus (low power)

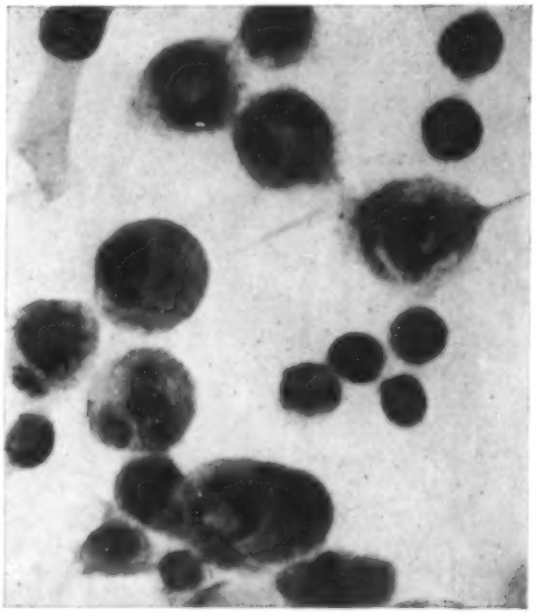

Fig. 4—Microphotograph showing amnion cells infected with type 7 adenovirus (high power)

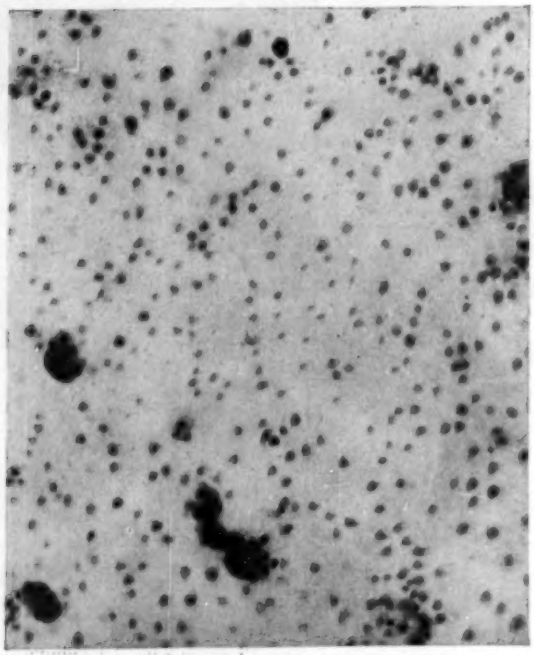

Fig. 5—Microphotograph showing amnion cells infected with measles virus (low power)

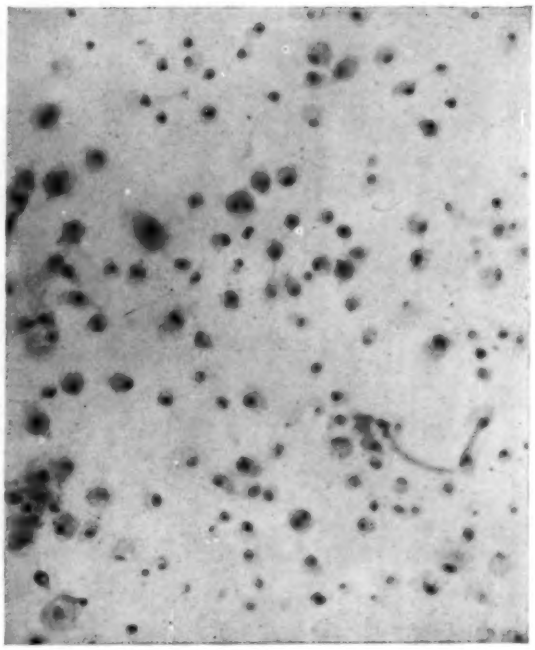

Fig. 6—Microphotograph showing amnion cells infected with polio virus (low power)

KURIAN AND MUKUNDAN—*Human Amnion Cells : Their Preparation and Use in Virology (p. 405)*

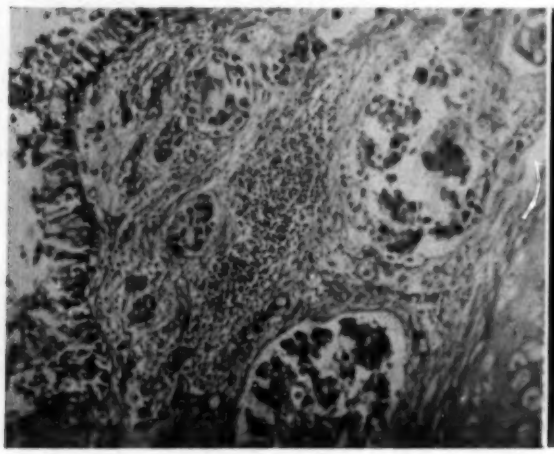

Fig. 1—Showing groups of tumour cells lying between the bronchial mucosa and the cartilage. H. & E. × 110

SAHGAL AND SAYED—*Bronchogenic Carcinoma in an Eighteen Year Old Boy (p. 408)*

Fig. 1—Radiogram of the hip joint showing gross destruction of the bony components besides other changes

BHARAT BHUSAN—*Bilateral Tuberculosis of the Hip (p. 409)*

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JOURNAL OF THE
INDIAN MEDICAL ASSOCIATION

CALCUTTA, NOVEMBER 1, 1960

EXAMINATION REFORM

Dissatisfaction prevails with the current pattern of examinations as with the methods of selection and training of students. It dates back to more than half a century and has now become more pronounced. A few have begun to demand total abolition of examinations. The vast majority however agree that examinations are an important and integral part of education in as much as they not only measure the progress of the student and set standards of accomplishment, but also serve a useful purpose in the programme of training. The pattern of examinations has been changing. An interesting account of the earliest examinations in general education held in this country was given in the *Statesman* in its issue dated December 6, 1958:

"Amusing as it may appear today, examinations in the schools of Calcutta a century and a half ago were as much a social event as an educational affair. Formal invitations were sent out by the managements of the schools to the elite of the city, requesting their company at the function to encourage the candidates by their presence during the examinations. The guests, soberly dressed for the occasion, arrived on time and stayed as long as the examinations lasted. Europeans and Indians, men and women, were amongst those asked and, indeed, an invitation was considered an index of the social status of the invited.

"The schools wore a festive look and the austerity which marks the presentday examinations was conspicuously absent. In the looks of the candidates one could read a sense of the self-importance they felt in being the heroes (and heroines) of the day; in the eyes of the teachers shone beam of joy at the prospect of fulfilment of their mission.

"The subjects for examination were few and, therefore, the examinations were not prolonged but concluded in the course of the day. The results were declared the same day and the ladies and gentlemen invited to watch the ceremony did not leave without congratulating the successful candidates. Prizes were in cash and in kind; the succesful candidates (and their teachers as well) were rewarded."

The present pattern of examination, which has no vestige of semblance to the earliest pattern, is the outcome of an evolutionary process. It has outlived its utility and has to be changed or reformed. It admittedly goads one to cramming lists of facts, "suppresses creative teaching and learning"[1], acts as a barrier to the acquisition of knowledge, defeats the main purpose of teaching which is not the mere collection of factual information but the intelligent and discriminative use of the knowledge which is applicable to a given problem and of correlation so essential in medical training, "impedes progress toward loftier educational objectives"[2] and is responsible for more failures in the examinations than there ought to be. The sole aim of students and teachers is to pass these factual examinations and not to acquire true education. These problems "loom large on the horizon of the Indian students for yet another reason, the significance that they have for employment after graduation"[2].

All that matters is the comprehensive examination at the end of training. Students tend to neglect their work for the greater part of the year and cram desperately at the end. Many of them fall victim to neurosis. Their minds get cramped and they develop a fear complex. The system of training is subordinate to examinations. This reresults in the students neglecting and evading their class work and concentrating on examinations. Success in the presentday examinations is more often a conquest of the whims and vagaries of examiners than a conquest of knowledge. Landells has remarked that these examinations "may be an examination of the students but they are not, as they should be, an examination of the teachers"[3]. Pickering says: "they seem designed not to test a student's capacity to discriminate but his capacity to reproduce material learned from the pages of textbooks or the notes of lectures"[4].

Leaving aside the practicals, the dominant feature of the traditional type of examinations is the essay-type question paper, in which the number of questions must necessarily be limited and the sample taken of the students' knowledge will be small. It introduces an undesirable element of luck in the examination and encourages the student to 'spot' questions, for he feels that his

[1] Examinations in Indian Higher Education; United States Information Service—New Delhi.

[2] Report of the Committee on the Indian Examinations Reform Project, United States Information Service—New Delhi.

[3] Landells, J. W.—*Lancet*, **2**: 240, 1956.

[4] Pickering, G. W.—*Brit. M. J.*, **2**: 115, 1956.

future depends upon an arbitrary selection of questions. Even with two question papers the ground covered is relatively a small part of the whole subject. The information contained in the usual voluminous textbooks cannot be adequately sampled in 8 or 10 or even 12 questions. These questions are a very poor test of the student's scale of values and capacity for independent judgment. They just tend to recall facts and figures and to cover some aspects only of the subject as prescribed in topical syllabi of the curriculum. The most serious objection is that the candidate is dependent to a great extent upon the examiner's purely subjective judgment, and the marking error is too great even when assessment is done consistently. The margin of error is directly proportional to the number of candidates and to the inexperience of examineres. This makes the test very unreliable. Studies in the U.K. and the U.S.A. have amply demonstrated this. Since for a student so much depends upon a single examination, it is of utmost importance that the test must be highly reliable within minimum error of assessment.

The need to abolish the present system and to have new orientation became compelling many years ago. Even in the case of practicals it was felt that there was much room for improvement. For this purpose the Government of India sent to the U.S.A., in 1958, a team of 10 Indian educators to review methods and teachniques utilised in American universities for the evaluation and measurement of student learnings. Later, in 1959, at the request of the Government of India, a team of American consultants was sent to India by the United States Department of State and the American Council on Education. Both these visits were financially underwritten by the India Wheat Loan Programme.

Their findings and recommendations are embodied in their Reports. They prefer new type tests to the essay-type test which, in their opinion, make it easy to secure a high degree of reliability. In the 'New' type the number of questions (which are short answer questions) asked is large and it is seen to that the various kinds of competence sought in the course are represented in proportion. This also solves the problem of proper coverage of the subject to a great extent. Stress is laid on defining the objectives of education and it is urged that provision should be made for testing the extent to which the candidate has attained them by clearly visualising these objectives and asking in every question paper a specific number of questions which aim at testing the candidate on each one of those objectives. This makes the setting of a good question paper "a matter of elaborate, thinking and painful toil"[1] and demands "as much imagination as effort"[1]. Such objective tests now-a-days rarely employ the true-false questions ; other types of questions, such as, multiple choice, matching, inter-linear, situational etc., are more typical of them. The object of such tests is "to measure the student's grasp of the goals of education that are broader and more important than the mere acquisition of factual information"[1]. They "can measure not only knowledge of facts but ability to analyse, interpret, synthesise and evaluate, as well as other complex abilities. Because it is a tool of education, objective measurement has of necessity progressed and developed to serve the more modern concepts of learning and teaching"[1]. One very great advantage is that marking is consistent.

The essay-type test is not completely ruled out. It may have at times to be employed along with the objective test. The difficulty in introducing the latter is realised and a phased programme is suggested. Different kinds of tests, such as, weekly or fortnightly quiz, six-weekly half-hour test, terminal one-hour test and three hours annual examination to be held throughout the year are recommended and also a comprehensive examination at the end of the entire course. All these tests have distinct functions. They are all not of the same type. The various tests conducted by college teachers and class and home work, etc., are recommended to be credited to the extent of 20 per cent of the total marks, subject to supervision by university authorities. The responsibility of evaluating the performance of his pupils is as a matter of principle, to be of the instructor's own, but it is recommended that the present arrangement of a mainly external agency for public and comprehensive examinations need not be disturbed at present. Each essay type script should be assessed by two (even more) examiners and the average of all the scores should be taken as a measure of the student's achievement.

These are some of the very important and useful recommendations made by the two teams not for *adoption* but for *adaptation* by us to our needs in a phased manner. It is hoped our universities will soon take effective steps toward a thorough review of teaching objectives and methods of evaluation. The ideal seems to be a continued and detailed assessment, that is, few examinations, or one continuous examination from the beginning to the end of the course. This requires careful organisation, constant supervision, and a high sense of individual responsibility on the part of all concerned.

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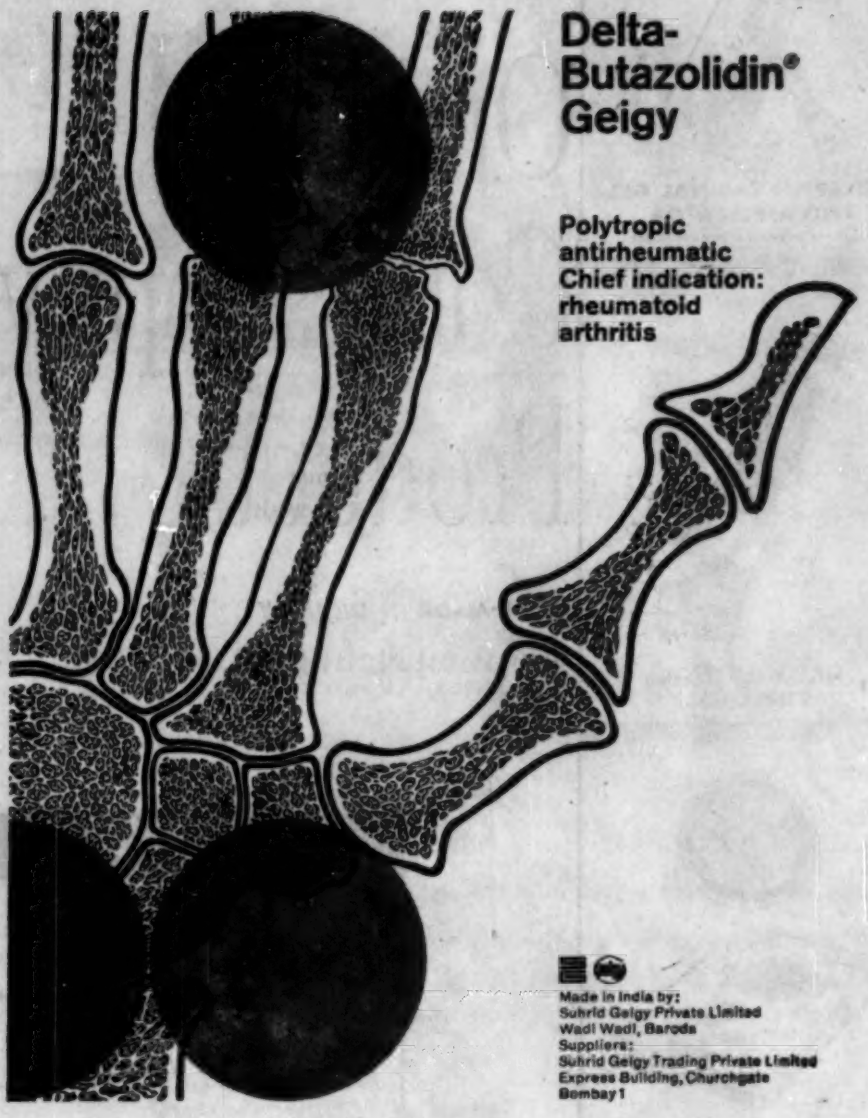

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GENERAL PRACTICE DIGEST

MANAGEMENT OF DIARRHOEAL DISEASE

The term 'diarrhoeal disease' covers disease states in which diarrhoea is a major sign. It is associated with inadequacy of personal and public hygienic facilities, and with over-crowding, poverty and malnutrition. It is an important cause of illness throughout the world, and a leading cause of death among infants and young children. The aetiology is multiple and often obscure. The relationship between diarrhoeal disease and malnutrition is still not settled. There is no standard treatment. Its prevention depends largely upon improvement in environmental sanitation, especially upon the provision of safe and adequate supply of piped water. The control of the disease should, therefore, aim at (a) improvement of personal and public hygiene, so as to lower morbidity, and (b) early and effective treatment of affected individuals, so as to lower mortality.

Medical Prophylaxis

There is no safe or effective immunological or chemoprophylactic method of protecting the individual exposed to enteric pathogens.

Treatment

Treatment includes 3 categories, listed in the order of importance :

1. Fluid therapy—(a) restoration of deficits of body water and electrolytes; (b) provision of fluids to offset normal and abnormal fluid losses, together with provision of at least minimal caloric requirements.

2. Prevention or reduction of further abnormal losses of fluid from the body, i.e., symptomatic treatment;

3. Destruction of the infecting agent.

FLUID THERAPY :

This is an important feature in the treatment of patients with diarrhoea. Modern treatment aims at rapid restoration of most of the child's deficit of water and sodium chloride, followed by further provision of more modest amounts of water and salt, together with the addition of potassium and at least sufficient carbohydrate to minimize the breakdown of body protein during the necessary period of diminished caloric intake. Failure in treatment is due to failure to recognise the severity of dehydration in small infants, failure to carry out therapy with requisite vigour initially, technical difficulties in the parenteral administration of fluids to small infants.

Rapid intravenous administration of fluid is the most effective treatment for severely dehydrated infants. Hypodermoclysis and slow intragastric drip through a nasogastric tube are the two simple techniques generally preferred. The simplest means of administration is by mouth. But because of vomiting, anorexia, fatigue, or drowsiness in the severely dehydrated infant or fear of aggravating the severity of the diarrhoea, repair of dehydration by the oral route is not practicable. Prevention of dehydration by adequate administration of fluids by mouth is however, of great value.

The baby's milk feedings are temporarily suspended and electrolyte solutions are given by mouth in their place. It should, however, be remembered that fluids useful and desirable for successful oral hydration are nutritionally inadequate. If administration of these fluids is unnecessarily prolonged, malnutrition may be produced or aggravated. Another danger consists in improper dilution of powders or liquid concentrates, resulting in administration to the patient of a solution too high in electrolyte content. The electrolyte content of fluids for maintenance of dehydration should be considerably lower than that for the initial repair of dehydration.

The most satisfactory simple maintenance solution is :

Sodium chloride ...	...	1·5 g.
Potassium chloride	...	2·0 g.
Syrup of raspberry	...	60 ml.
Water to make ...	...	1000 ml.

This solution may be offered to infants *ad libitum* in place of milk mixtures. Dextrose may be substituted for the syrup in amounts of 35 (isotonic) to 100 g. to make the preparation suitable for parenteral use. Some authorities prefer to replace up to half the chloride with phosphate and bicarbonate—the bicarbonate commonly takes the form of lactate.

PREVENTION OF FURTHER FLUID LOSS :

Administration of parentral fluids for prolonged periods (i.e. for more than a day or two) results in inadequate provision of calories, especially in malnourished subjects. There is also the dangers from temporary under-provision of adequate nutritional needs with fluids.

Suppression of oral intake is very effective in reducing loss of water and electrolytes from the body. Opium derivatives are notably ineffective in checking diarrhoea. Preparations containing pectin, hemicellulose, and other hygroscopic agents absorb water and electrolytes excreted into the bowel. Carrot *puree* provides the needed calories and electrolytes.

The use of acid milks (e.g. yoghourt, lactic acid milk, vinegar milk and 'acidophyllus' milk) is recommended.

ANTIMICROBIAL THERAPY :

Shigella—Sulphadiazine in relatively small doses has been the drug of choice in shigella infections. Its defect is the emergence of resistant strains. Tetracyclines and chloramphenicol are effective against shigella but resistant strains often emerge.

Salmonella—Chloramphenicol has proved ineffective.

Escherichia coli—The last drug for this purpose is neomycin. But resistant forms have been seen.

Other agents—In infections with other than Shigella or Salmonella, the use of sulphadiazine, chloramphenicol or oxytetracycline in therapeutic doses are not very effective.

Institutional outbreaks of diarrhoeal disease—Shigellosis endemic in institutions and nursery outbreaks of E. coli diarrhoea can be controlled by chemotherapy pro-

vided all persons, sick and well alike, in the institution are treated at the same time. Concurrent salutary precautions—especially hand-washing by all personnel before and after each contact with a patient are also essential.

Outpatient rehydration centres—For non-hospitalised patients, separate wards are attached to the outpatient's department where babies may remain for hydration, chemotherapy, dietary advice, and observation for periods up to two days. There is nursing supervision at night, and therapy is carried out during the day only. Here fluids are routinely given intravenously.

Oral Hydration Programme of UNRWA Health Centre—Infants not requiring hospitalisation are given electrolyte solutions by mouth in health centres, followed at home by restrictions of milk for from 12 to 24 hours and administration of salted rice water or sweetened weak tea. Mothers of nursing babies are then urged to return the baby to the breast. Other babies, as well as breast-fed babies needing supplement, then embark on a rigid and complex dietary programme.

—From an article by Nelson K. Ordway, *Bull. Wld. Hlth. Org.*, **23**: 73, 1960

CURRENT MEDICAL LITERATURE

Hydrochlorothiazide vs. Chlorothiazide as Blood Ammonia and Electrolyte in Cirrhosis

MAGID, G. J. AND HEALEY, L. A. (*Am. J. Gastroenterol.*, **33**: 467, 1960) from the Department of Medicine, University of Washington School of Medicine, Seattle, Wash., give in the following lines the summary of their observations on the results of comparative study of hydrochlorothiazide and chlorothiazide on blood ammonia and electrolyte balance in cirrhotic patients:

Hydrochlorothiazide is a new oral diuretic which, in most cases, appears to be as effective as chlorothiazide at 1/10th the dosage. Urinary electrolyte excretion patterns with the two drugs vary in that hydrochlorothiazide more consistently produces a greater excretion of chloride ion and less bicarbonate and causes more of a tendency towards alkalosis. It thus resembles more the action of the mercurials and less of the carbonic anhydrase inhibitors than does chlorothiazide. There appears to be a slightly longer duration of activity with hydrochlorothiazide with saluresis continuing significantly at the end of ten hours while with chlorothiazide, excretion falls near base-line levels by the end of ten hours.

The optimal dosage appears to lie between 50 and 100 mg. or 7 to 15 mg./kg. No adverse haematological effects have been noted in the present small series or in a larger series of 39 patients who have received hydrochlorothiazide over the past six months. The only side-effect noted has been epigastric distress in two of these patients.

A decrease in serum potassium following repeated daily administration occurred in most patients. This can be corrected by daily supplementary potassium, approximately 30 to 70 mEq. per day.

On the basis of our limited but quantitative studies on five cirrhotic patients, it would be impossible to draw any conclusions regarding a difference in the effect of either drug on blood ammonia, or the production of hepatic encephalopathy. Both drugs, however, seem safer than acetazolamide in this respect. It would appear that hydrochlorothiazide represents a valuable addition to the constantly improving armamentarium of the oral diuretic agents.

Local Corticosteroid Treatment in Severe Attacks of Ulcerative Colitis

TRUELOVE, S. C. (*Brit. M. J.*, **2**: 102, 1960) from the Radcliffe Infirmary, Oxford, gives in the following lines the summary of his observations on the local hydrocortisone therapy in severe ulcerative colitis:

Local corticosteroid treatment to the colon by means of a rectal drip of hydrocortisone hemisuccinate solution has been used in most in-patients with severe attacks of ulcerative colitis treated in Oxford since 1956. It appears to be best to combine it with systemic corticosteroid therapy. The simultaneous application of certain general medical measures is of profound importance.

Representative case-histories are given to illustrate some of the responses obtained and some of the problems entailed in the use of this form of treatment.

A provisional scheme for the medical treatment of a severe uncomplicated attack of the ulcerative colitis, incorporating local corticosteroid therapy as one of its main features, has been drawn up. The essential features are as follows:

General medical measures should be instituted without delay and consist in (a) correction of dehydration and electrolyte depletion, special attention being paid to potassium depletion; (b) blood transfusion, to be repeated as often as necessary; (c) maintenance of nutritional state by high-calorie high-protein diet; and (d) vitamin supplements.

Systemic corticosteroid therapy should normally be applied by oral administration—for example, prednisolone in an initial dose of 15 mg. four times a day—but, if there is vomiting, treatment should begin with intravenous prednisolone phosphate, 25 mg. twice daily.

Local corticosteroid therapy consists in a rectal drip of 100 mg. of hydrocortisone hemisuccinate sodium in saline, morning and evening. Retention of the evening drip is facilitated by preliminary intravenous injection of propantheline bromide, but overdosage with this agent must be avoided.

Sulphonamides and antibiotics occupy a secondary role. Broad-spectrum antibiotics should not normally be given by mouth in ulcerative colitis, but they can be used parenterally for a few days at the start of treatment if there is high fever.

Since the addition of local corticosteroid therapy to the medical treatment of ulcerative colitis the case-fatality rate for in-patients admitted to two Oxford hospitals has shown a sharp decrease, and is now about 1·5 per cent, after having been steadily around 8 per cent during the previous 12 years. The evidence that at least a part of this recent improvement in results is

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directly due to local corticosteroid treatment is discussed.

Thrombocytopenia Induced by PAS

GREGG, J. A. AND MAYOCK, R. L. (*J.A.M.A.*, **172**: 1909, 1960) from the Pulmonary Disease Service, Philadelphia General Hospital, Philadelphia, report that a 63-year-old man developed thrombocytopenia while being treated with streptomycin, isoniazid, and sodium para-aminosalicylic acid (PAS) for active pulmonary tuberculosis. He had no history of previous allergic manifestations. He had recently developed mild diabetes and suffered a crushing injury of the left hand. In order to determine which of the medicaments caused the thrombocytopenia, test doses of each were administered to the patient after his platelet count had returned to normal. A severe decrease in platelet count occurred one hour after administration of PAS; it did not occur when the other drugs were administered. Concurrent administration of cortisone with PAS apparently had no effect on the thrombocytopenia. This is believed to be the second reported instance of thrombocytopenia in which PAS proved to be the offending agent.

Solitary Coin Lesions of the Lung

PISCHNOTTE, W. O. AND SAMMONS, B. P. (*J.A.M.A.*, **173**: 1522, 1960) from the U.S. Naval Hospital, St. Albans, N.Y., from a clinical study of the pulmonary lesions described as coin lesions because of their roentgenographic appearance as seen in 95 patients, write that the study was limited to solitary lesions, homogeneous or calcified, 1·0 to 4·5 cm. in size, round or oval in shape, with sharp borders surrounded by normal lung, found during the examination of asymptomatic patients. The final diagnosis was based on histological examination. This showed the lesion to be malignant in 6 cases. In 55 cases it was a fibrocaseous granuloma, and in 14 it was a tuberculoma. The size of the lesion was not significant. Calcification in a solitary pulmonary nodule is a good but not an absolute sign that it is benign. The authors believe that solitary pulmonary lesions, with few exceptions, should be excised and examined histologically.

Pulmonary Complications of Rheumatoid Arthritis

Various pulmonary and pleural complications arise in the course of rheumatoid arthritis, but most of them do not seem to differ from the respiratory disorders seen in the ordinary run of general hospital admissions. In a large controlled study of hospital cases Aronoff *et al* found no lung lesion characteristic of rheumatoid arthritis. There are nevertheless grounds for believing that rheumatoid arthritis can in fact cause or modify certain pulmonary lesions.

Firstly, histologically typical rheumatoid nodules sometimes appear in the lungs, and they may be widely disseminated through the lungs, pleura, pericardium, and heart, as well as in the subcutaneous tissue and muscles. Secondly (and the only significant association between rheumatoid arthritis and lung disease so far demonstrated on epidemiological grounds) are the nodular changes described by Caplan in the lungs of coalminers with rheumatoid arthritis—lesions seen also in occupations involving other dust hazards. This form of nodular fibrosis, consisting of many well-defined rounded shadows on a background of slight pneumoconiosis, is often distinguishable from progressive massive fibrosis; and as Miall has suggested, it is probably a particular type of tissue reaction to dust and tuberculosis in the lungs of miners who are predisposed to rheumatoid arthritis. Thirdly, there may develop diffuse lung changes in the form of a chronic fibrosing pneumonitis, first described in association with rheumatoid arthritis by Ellman and Ball. Radiographs show diffuse reticular shadows which are not in themselves specific, and, as Scadding pointed out, it is hard to be sure whether the changes are due to the same disease process as the rheumatoid arthritis or to some other cause. It is presumably progression of the interstitial fibrosis which leads to the appearance of 'honeycomb lung', also noted in association with rheumatoid arthritis. Fourthly, the generalised arteritis of rheumatoid disease may involve pulmonary vessels, and has been known to cause pulmonary hypertension; and it is of interest that Wade and Ball, in their series of patients with idiopathic pulmonary hypertension, found some with pulmonary arteritis and a positive Rose-Waaler test but no clinically evident rheumatoid arthritis. Finally, there is the complication of pleural effusion, with or without underlying parenchymatous lung lesions, usually appearing shortly after the onset of rheumatoid arthritis or accompanying an exacerbation of the disease. It seems to be remarkable for its predominance in males, in contrast to the increased incidence of rheumatoid arthritis itself in women.

Pleural effusion is the principal feature noted by Horler and Thompson in an extensive review of pleural and pulmonary complications of rheumatoid arthritis in 180 patients. They found that 9 patients, 8 of them males, had a pleural effusion for which no cause could be found other than rheumatoid disease, though they emphasise the importance of excluding other connective tissue disorders, tuberculosis, and malignant disease. The pleural fluids were clear and pale yellow and had the characters of an inflammatory exudate with high protein content and varying proportion of neutrophils and lymphocytes. 2 of the patients also had coincident parenchymatous lung lesions, in 1 nodular and in the other diffuse and fibrotic. Another male patient without pleural effusion showed the radiological appearance of 'honeycomb lung'. In most instances the effusion appeared with an acute febrile respiratory illness related to the onset of arthritis, though in some the effusion preceded the arthritis, and it is perhaps arguable that the relationship was no more than that of a precipitating factor. The series nevertheless gives convincing additional evidence that rheumatoid pleural effusion is a clinical entity. (Annotation *Lancet*, **1**: 812, 1960).

Tropical Eosinophilia

WEBB, J. K. G., JOB, C. K. AND GAULT, R. W. (*Lancet*, **1**: 835, 1960) from the Christian Medical College, Vellore, South India, dealing with tropical pulmonary

eosinophilia describe the pathological changes in the lung, liver, and lymphonodes of typical cases of tropical pulmonary eosinophilia and observe that microfilariae have been demonstrated in the centre of nodules in each of these tissues, suggesting that direct invasion by these organisms is the cause of the lesion in this disease.

Cases are reported with lymph-node and hepatic, but without lung, involvement. The lesions in these cases were similar to those seen in the lung, and microfilariae were present. A plea is made to enlarge the concept of tropical eosinophilia to include such cases, and at the same time to restrict the diagnosis to those in which a filarial infection is proved or suspected.

Microfilariae recovered from lymph-nodes have been provisionally identified as *W. bancrofti-type* ; but, on the analogy of findings in Malaya, these may be of animal origin, and zoonotic filariasis remains the most likely explanation of tropical eosinophilia.

Asymptomatic Bacilluria in Diabetics

RENGARTS, R. T. (*Am. J. M. Sc.*, **239** : 159, 1960) observes that not infrequently diabetic patients entering hospital are found to have positive urine cultures despite lack of symptoms of urinary tract infection. Furthermore, after appropriate treatment for the asymptomatic bacilluria, considerable decrease in the daily requirement of insulin often occurs. These findings suggested that the bacilluria might be of importance clinically, and the question arose as to what features characterise the diabetic who enters hospital with asymptomatic bacilluria.

All diabetic patients admitted to one section of the Joslin clinic service of the New England Deaconess Hospital, Boston, submitted 'clean' voided specimens of urine for culture, colony count, sensitivity studies, and determination of sugar content. Male patients submitted midstream clean voided specimens. Females were cleansed with tincture of benzalkonium (Zephiran) chloride, 1 : 1000, and specimens were collected in a sterile container. Samples from specimens were incubated within one hour after voiding. Among the 68 patients (22 males and 46 females) without urinary tract disease, 23 (34 per cent) were found to have asymptomatic bacilluria with colony counts greater than 100,000 per millilitre of urine. Sixty-eight per cent of the patients confined to bed prior to entry had bacilluria to this extent, as compared with 14 per cent of the patients not confined to bed prior to hospital admission. Findings in the urinary sediment were of little value in indicating those patients with asymptomatic bacilluria of significant degree. The sugar content of the urine showed no consistent correlation with the frequency of bacilluria or the number of organisms cultured. Organisms causing bacilluria to the extent of 100,000 per milliliter of urine, or greater, were most frequently *Escherichia coli*, *Staphylococcus albus*, and Proteus and Aerobacter organisms.

Bacilluria with a colony count greater than 100,000 per millilitre of urine was present in 41 per cent of females and 18 per cent of males. Asymptomatic bacilluria was definitely more common in diabetic patients who had been confined to bed prior to admission than in those who had been ambulatory. The author concludes that, among diabetic patients entering hospital for various reasons, there is a significant percentage with asymptomatic bacilluria despite the absence of symptoms referable to urinary tract infection. Only by routine cultures and colony count carried out with a 'clean' voided specimen of urine can such bacilluria be found.

Dilatation of the Colon, a Serious Complication of Ulcerative Colitis

KORELITZ, B. I. AND JANOWITZ, H. D. (*Ann. Int. Med.*, **53** : 153, 1960) from the Division of Gastroenterology, Department of Medicine, the Mount Sinai Hospital, New York, N.Y. observe :

The rapid development of striking colonic distention is one of the most serious complications of ulcerative colitis, usually occurring during an acute exacerbation of the chronic disease. A study of 19 episodes in 16 patients is reported, with description of clinical, radiologic and pathologic features, as well as speculations on aetiology. A simple X-ray film of the abdomen is usually diagnostic, and reveals marked colonic dilatation, most pronounced in the transverse colon and sparing the rectum. Deep ulcerations are seen by air contrast. Pathologically, involvement of all elements of the colon with inflammatory changes was striking. Perforation was demonstrated in four cases. There were three deaths, a mortality of 19 per cent. Nine patients required emergency surgery. Six were treated by ileostomy and subtotal colectomy, with one postoperative death and three prolonged, stormy courses. Three were treated with decompressing caecostomy, all with improvement. It is emphasised that the results of this approach were so favourable as to demand further trial for these specific circumstances. Twelve patients were treated with ACTH or adrenal steroids coincident with the colonic distention, and in some instances the beneficial or detrimental results were clearly evident. Recommendations for future management include the indications for ACTH, adrenal corticoids, long tube intubation and decompressing caecostomy.

Bell's Palsy

COHEN, D. D. (*J.A.M.A.*, **173** : 1563, 1960) from the Calabasas Medical Centre writes :

Sudden, spontaneous interruption of the function of the seventh cranial nerve is no longer treated expectantly. It must be dealt with as a medical emergency to relieve the ischaemia of the nerve in the facial canal. The ischaemia results from vasospasm and is aggravated by reactive oedema. The pathological process is that of ischaemic neuritis. Treatment should be started as soon after the onset of paralysis as possible, preferably within the first 48 hours. It consists of blocking the stellate ganglion and administering nicotinic acid parenterally to achieve vasodilatation and administering corticosteroids to reduce oedema. Although in most cases recovery is spontaneous, the possibility of permanent distressing sequelae, such as residual paralysis, contracture, associated movements, and hemifacial spasm makes prompt treatment essential.

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CURRENT TOPICS

INTERN AND RESIDENCY TRAINING IN CANADA

R. N. CHATTERJEE, M.S.

Hony. Secretary, Indian Medical Association
Madhya Pradesh State Branch and
Member, Central Working Committee, I.M.A.
Jabalpur

In January last I went to Canada for a short post-graduate training. I got an appointment as Assistant Resident in Surgery. This report is based on my personal experience and discussions I had with Indian, Pakistani and other doctors in Canada and U.S.A. I visited Medical Centres in Saskachewan, Wennipeg, Toronto, Chicago, Washington and New York. I met about a dozen Indian doctors with whom I discussed our training. As this subject was raised at the meeting of the Working Committee at Indore, I studied it from that angle, i.e., whether this training is beneficial to our Indian doctors or not. On my way to Canada I stopped at London for a week and met a few Indian doctors there too who were employed as Registrars, etc., so that I could compare the working conditions of England and Canada.

Appointments—Medical graduates are appointed as follows :

1. Rotating Intern : Ist year.
2. Intern—in one subject : Ist or IInd year.
3. Assistant Resident : IInd or IIIrd year.
4. Resident : IIIrd or IVth year.

Pay—Pay varies in different hospitals, usually in good teaching hospitals. Pay is less here than in general or other hospitals where the pay is more. It is easier to get internship in teaching hospitals where the pay is less. The rates of pay are as follows :

Intern 100 to 150 dollars (depending on the hospital).
Assistant Resident 150 to 200 dollars.
Resident 200 to 250 dollars.

Besides the pay, every one gets full maintenance as lodging, boarding, uniform and laundry allowances. If one is living outside, he gets about 40 to 50 dollars extra.

As regards pay it is quite satisfactory according to the Indian standards.

Nature of duties—Interns are required to do the job of a junior house surgeon or physician. Assistant Residents and Residents are required to do a job equivalent to the work of a senior House Surgeon or Registrar of an Indian hospital. Usually a Resident there cannot be compared with our Resident Surgeon who holds a more responsible post. Interns are required to write the histories and look after the patients. They are not held responsible for pre- and post-operative treatment which is directly under the anaesthetists and surgeons. Interns usually are second or third assistants during the operation. Residents and Assistant Residents are given more responsibilities and they are usually 1st or 2nd assistants during operation. Sometimes they are asked to perform an operation under the guidance of a surgeon.

On the whole, I found that there is less responsibility placed on an Intern or Resident than what is placed on our House Surgeons or Registrars or Resident Surgeons

Emergencies—Emergencies in the hospital are usually tackled by the surgeons of the day or by the patient's own surgeon. Residents are not allowed to tackle emergencies independently as is the custom in India.

Types of hospitals—Much depends on the type of hospitals. There are two types of hospitals, the university hospitals and the general hospitals. University hospitals are the teaching hospitals like our medical college hospitals. Here Interns and Residents get sufficient theoretical teaching. They also learn enough from seminars, clinical meetings and symposia which are held regularly. But practical knowledge they do not acquire much as they get very few chances for independent work. Here the patients are all insured and their condition is not so helpless as our general ward patients. But on the whole, these hospitals are much better than our hospitals and the Interns have opportunities to learn much. In the general hospitals things are quite different. In a few general hospitals Interns get sufficient chances and opportunities to learn (by their mistakes even). But in some other general hospitals Interns do not get any opportunity to learn at all and he has to confine himself to writing histories, working as 2nd or 3rd assistants during operations, and in emergency room without much responsibility.

The standard of clinical meetings and lectures and seminars in these general hospitals is poor as the surgeons and physicians are private practitioners without any teaching appointments.

Some of the general hospitals are even worse. Interns and Residents are appointed there for cheap labour.

In the university hospitals of Montreal, Toronto and Vancouver there are a few general wards and training of Interns is much better.

Canadian doctors usually go to university hospitals for training as Interns or Residents. Many of the Canadian doctors go to important teaching institutions of U.S.A., to receive training. General hospitals are usually manned by non-Canadians or non-Americans. In these hospitals you will find quite a number of Mexicans, Italians, Chinese, Koreans, Pakistanis and Indians. Some of these Interns can hardly speak English and many of the foreign medical graduates are not even qualified. There was an important article in their *Life* magazine regarding these foreign Interns and it warned the patients not to have their services, as many of them do not understand English and are even not qualified. (As we know a few of our non-qualified people have entered in some hospitals).

Because of all this, Interns are not taken in the category of doctors. I was asked on so many occasions whether I was an Intern or a Doctor?

Hours of work—Usual hours of work are from 8 A.M. to 5 P.M. During this time all are supposed to be in the hospital premises. Every third or fourth day, Interns

have to attend for night duties. On the whole their duties are lighter than that of our house surgeons or house physicians.

Refresher courses—Practically in every big town a refresher course is held every month, on an important subject and that is very beneficial to the resident staff.

Research—In teaching hospitals, sufficient scope is there for doing research or for writing scientific papers. In general hospitals opportunity is much less.

Scope for a postgraduate degree—There is not much scope for obtaining a postgraduate degree in Canada or U.S.A. In Canada one can appear in F.R.C.S. or F.R.C.P. only after 4 years of Intern and Resident training (training in India is not counted). Examinations are held once a year, so if one fails in one examination he does not get an opportunity for full one year (In England one can appear four times, a year).

Usually Canadians and Americans appear in the specialty board examinations to become specialists, but that examination has no value for Indian doctors, unless they like to settle in Canada or U.S.A.

So on the whole, I cannot advise any one to go to Canada for a postgraduate degree. Even after a stay of five years he may not get a degree.

Social aspect—Members of the staff do not regard Interns as full fledged doctors and so usually do not mix with them. They usually do not invite them for tea, etc., at their residence. On the whole, I found that members of the staff do not want to mix with Interns socially.

But in the community, Interns can mix and are welcome in every sphere. I never found any anti-Indian feeling anywhere. But at several places I was asked that question whether I was a Doctor or an Intern?

Food—Food served to Interns and Residents is quite satisfactory. Though the cooking is of English style yet there is no complaint about it. Usually there is a separate dining room for Interns and Residents where members of the staff also take their food.

Climate—As is well known, climate in Canada is extremely cold and everyone going there should be forewarned. But that does not come in one's way. All the hospitals, houses, restaurants, shops, etc., are centrally heated and you have to work wearing cotton clothing only. When you want to go out in winter then only the extreme cold will trouble you.

In central Canada in winter (from October to March) you cannot keep yourself out for more than 20 minutes. After 20 minutes you will have to take shelter to make yourself warm.

General impression—There is no doubt that American or Canadian hospitals are much better than our Indian hospitals and on the whole I found training over there very satisfactory. Training in university hospitals is much better and our students can safely be sent over there. Only in good general hospitals our students can be sent. Some general hospitals employ Interns as a source of cheap labour. No Canadian doctor joins these general hospitals and they are getting these doctors from other countries by advertising in their journals. I saw a number of advertisements in *B.M.J.* As it is very difficult to judge as to which general hospital is good, I think the safest course will be to send our *candidates to university hospitals only*. One Executive director of a general hospital told me to send a few doctors from India as they were short of Interns.

The second difficulty is about the postgraduate degree. American and Canadian speciality board examinations are not recognised in India. Canadian F.R.C.S. or F.R.C.P. is a difficult proposition for our Indian students who have to stay there for a minimum of five years. I met a few doctors who were there for 5 or more years and who could not get a postgraduate degree and have become completely frustrated. Some of them are thinking of settling over there. Citizenship is difficult to obtain. But one can have it earlier provided he marries a girl of that country. In such cases, young graduates will be completely lost to our country where we need them most. I met one doctor who was sent by our I.M.A. in 1956. He was amongst eight who were sent to Ottawa general hospital and was the only survival. He was working in Neuro-surgery in the university hospital of Saskachewan. Rest of his friends have gone back to India or to England.

So I felt that majority get frustrated as they cannot get a post-graduate degree, and training only is not helpful in India. Moreover this training is a more practical training and for examination purposes it is not of much benefit. *Should we send our M.B.B.S.'s* (i.e., graduates)? They can be sent there and they will learn a lot. But they must be warned that they are not going there for a postgraduate degree. After two or three years of training they can come to England or to India and can appear for the postgraduate degree. Our students can take up those subjects in which postgraduate degree is not much required for a post in India such as Anaesthesiology. Radiology, Paediatrics, Tuberculosis, Dermatology, etc.

Should we send our students after postgraduation?—This is again a difficult proposition. Even after postgraduation they will be appointed as Interns or Assistant Residents, which do not carry much responsibility. But still they will learn a good deal. They can be appointed in Orthopaedics, Neurosurgery and Genitourinary surgery or Cardiology, etc., and they will definitely come back wiser.

We can correspond with Canadian Medical Association or American Medical Association for giving to our postgraduates higher appointments with greater responsibilities.

I found American hospitals better than Canadian hospitals. But now the American hospitals are closed to direct recruitment from I.M.A. One has to pass the qualifying examination to get into those American hospitals. But that examination is not at all difficult and our students can safely go through it. They started the examination to prevent non-qualified people from other countries entering the hospital. They were such people who even could not speak English and were no better than quacks. To guard against these they have started that examination and we cannot blame them as we know that as many as ten Ayurvedacharyas have

entered the American hospitals as Interns, before they started this examination. Lastly, when I met a number of office-bearers of B.M.A. at London and a few of our Indian students, I was wondering if we can send our students to England for training, where they can get a post-graduate degree without wasting many years. All these posts are advertised in *B.M.J.* and candidates are called for personal interview. If they can reserve some posts for Indian students, they can be selected and sent direct from here. Hospital authorities and the B.M.A. can appoint the members of the Selection Committee in consultation with I.M.A. At present our students are going to England in large numbers. As soon as they reach there they look into the advertisements and apply and try to get one post as early as possible. This may not be beneficial to them so far their training is concerned. If we can get a few posts reserved for us or can get appointments without personal interview I think it will be very beneficial to our Indian students.

Finally, I wish to suggest that it would be best if our students are encouraged to do the post-graduate here in India only. For this, I.M.A. can request all the college and university authorities to start special post-graduate classes as they have done partly in K. G. Medical College, Lucknow. For this purpose a large number of junior posts should be created as Resident and Assistant Resident, etc., in the medical or associated hospitals. Big hospitals which are not attached to the medical colleges may be recognised by the universities for post-graduate studies. I am sure our students will get more chances to learn in India than in foreign hospitals.

Only a small selected number of students should be sent to Canada or U.S.A. and that only to university hospitals.

INFLUENCE OF EDITORS

The question of how far an editor should go in correcting an author's manuscript was discussed on April 29 at a meeting of the Scientific Publications Council. Dr. G. E. W. Wolstenholme (Ciba Foundation) was in the chair.

Dr. R. D. Keynes (Cambridge) said an editor has a dual responsibility (a) to the author and (b) to the reader. Many authors submit manuscripts containing a long historical introduction and a discussion that is a wearisome repetition of the results. Sometimes the statistical evidence is inadequate, means are calculated incorrectly and the author gives figures that do not support what he says. However, conformity to a standard form of presentation should not be insisted on too rigidly, and in matters of taste the author should always have the last word. But an editor should insist on clarity; and he must be fierce in ensuring the accuracy of any data that are published. Some editors send the author a report from an anonymous referee, but anonymity is apt to cause resentment; an editor writing personally can often be much ruder and more effective without causing ill-feeling. As a university teacher, Dr. Keynes was concerned at the number of text-books and symposium volumes that bear the names of eminent scientists as editors, but in which the so-called editors have not really done any editing at all. The frequent contradictions in the different chapters are troublesome to student and teacher alike. Editorial interference may be objectionable, but editorial neglect is worse.

Dr. A. S. Parkes (National Institute for Medical Research) agreed that an editor had many responsibilities; but in the long run the author bears the full responsibility for every paper bearing his name. In particular, an editor should not rely too much on a referee, who may well have his own axe to grind, and who, being anonymous, has no right to try to insist on major alterations to someone else's paper. He recognised fully, from his own experience, that young authors can benefit enormously from the constructive criticism of more experienced writers; but papers should go through the moulding stage before they are sent for publication. The head of a department should see that all papers leaving it are in good shape and worthy to bear its name.

Prof. E J. King (British Postgraduate Medical School) said that manuscripts written by scientists are often very poor, and heads of department cannot be expected to replace the experienced editor in the highly skilled task of revising for publication. Editing is a burdensome job, and most scientists are grateful to the editors who give their time to it. Editors should do as much rewriting as they think necessary. But an editor needs to be a diplomat: he must know how to effect a useful compromise without causing resentment.

Mr. A. L. Bacharach (*J. Nutrition*) said that the basic question is: How much should an editor do? Some scientists are glad to have their manuscripts revised, but others go so far as to assert that papers should appear just as they are written, even complete with grammatical errors. The purpose of publication is to spread new information, and a paper will do this only if the reader has confidence in the author. Grammatical errors, verbosity and repetition undermine the confidence of the reader and should be corrected. It is helpful if manuscripts go through a process of 'internal editing' within a department (not necessarily by the head) before they are sent for publication. In one department that had adopted this procedure for more than fifteen years, only one in some two hundred of the papers sent for publication had been rejected or returned for rewriting. An editor is entitled to make every alteration he thinks necessary to improve the clarity and intelligibility of a paper, so that it can be read with intellectual comfort. Those who resist such alterations are generally the bad scientists—the good ones are glad to have their papers improved.

Dr. R. K. Callow (National Institute for Medical Research) said that a part of the problem is that some scientists are completely blind to typographical, grammatical and logical errors and unable to understand the concern that others feel about them. In his experience, a journal in which an editorial board of scientists did most of the editing, and a staff editor did only subediting, achieved the happiest author-editor relationship. It was less satisfactory to have a system of referring in

which the expression of opinion was limited ('suitable' or 'not suitable' for acceptance) and papers were altered by a staff editor to fit them into a stereotyped scheme for the concise recording of data.

Dr. I. Bush (Oxford) complained of over-zealous editors and laggard referees who hold up publications while making numerous changes, which are not of the first importance, in the manuscripts. Editorial requirements are so numerous and various these days that many otherwise conscientious authors do not take the maximum trouble in preparing their manuscripts since experience leads them to believe that, whatever they do, the editors will always raise a large number of objections or alternatives. He pointed out that Dr. Detlev Bronk had recommended a decrease in 'editorialising' in an article some years ago.

Dr. T. H. Osgood (U.S. Embassy) said that in his American experience, the insensitivity of some authors to shades of meaning lent credibility to the story told by a fellow editor that occasionally his letters of rejection took the form : "Dear Sir, Although your paper fills a much-needed gap in the literature, I regret that it cannot be accepted for publication". It was unfortunate that editors were, on occasion, forced to undertake the education of authors, but when it became known that the correction of errors and the questioning of editorial judgment involved considerable delay, authors took exceptional pains to present good manuscripts. In view of the normal anxiety of an author to see his paper in print, the threat of delay was the best weapon for ensuring the effectiveness of editorial influence. An editor who did his job well must expect to make one or two enemies every year.

Mr. F. Clark (*Biochemical J.*) described the work of a professional editor, whose services may be required for large scientific journals where much of the editorial work formerly done by the chairman and other members of the editorial board can be transferred to the editorial office.

Dr. G. E. W. Wolstenholme (Ciba Foundation) said it is difficult for scientists from abroad to understand the requirements of journals in another country. Some scientists whose papers are rejected are convinced that the editors have a personal grudge against them.

This short meeting had shown how helpful it could be for authors and editors to get to know each other : in that way many mutual difficulties could be ironed out.

Courtesy *Nature*, **187** : 120, July 9, 1960.

NOTES AND NEWS

Paracelsus Award for Doctors

Three doctors were awarded the Paracelsus Medal at an impressive joint opening session of the XIVth General Assembly of The World Medical Association and the 63rd Deutsche Arztetag convening in the Berlin Congress Hall, West Berlin, Germany on September 16, 1960. Those honoured are :

Dr. Curt Emmerich of Baden-Baden, Germany, in recognition of his untiring efforts to picture for the people of the world the true character of the doctors who make up the medical profession. Dr. Emmerich, whose writings are published under the pseudonym of Peter Bamm, is being cited for having established a memorial to the reputation of the medical profession in his book *The Invisible Flag* which has been translated for publication in eight languages. In this book Dr. Emmerich vividly demonstrates that under the invisible flag of humanity in accordance with the Hippocratic oath, the medical profession, in modern civilisation as in ancient times, is at work all over the world at all times protecting life and giving aid to suffering mankind.

Dr. Walter Stoeckel of Berlin, Germany, in recognition of his outstanding contributions to medical science. Dr. Stoeckel is Professor of Obstetrics and Gynaecology, Professor of Urology, and Emeritus Director of the University Women's Clinic.

Dr. Louis H. Bauer of New York City, Secretary General of The World Medical Association, in recognition of the service he has rendered to the medical profession of the world.

The Paracelsus Medal, named after the 16th century physician and chemist who promoted use of specific remedies and was the author of many medical works, was established in 1952 as the highest award bestowed by the "Deutsche Arztetag" (German Physicians' Day). It is usually awarded to three distinguished doctors annually at an impressive ceremony.

New Drug for Cancer

A Japanese scientist has developed a new synthetic drug for the treatment of cancer, which eliminates the harmful side-effects of nitrogen mustard previously used to attack cancer-cells.

The new drug, also based on nitrogen, was developed by Dr. Kanem Sakurai, Head of the Chemotherapy Department of the Japanese Pharmacological Institute. Dr. Sakurai told the International Cancerology Conference in Tokyo on October 8, 1960, that the drug was known as "Number 687" (the number of experiments required to perfect it) and could be used for killing cancerous cells without harming healthy ones.

The Paracelsus Medal, named after the 16th century described an experiment in which two groups of mice were inoculated with cancer-cells. One group, which received no treatment died in 10 days. Among the second group, however, which was treated with "687", 95 per cent of the mice were still alive on the 20th day. Those that survived for 30 days were said to be on the road to recovery.

Has Milk Anti-Cancer Properties?

Whether milk has anti-cancer properties or not was hotly debated at the symposium on the geographic pathology of cancer at Tokyo on October 9, 1960, the third day of the International Cancer Conference.

Dr Takeshi Hirayama, of the National Institute of Health, declared that stomach cancer is rare among those who habitually drink milk, that the intake of too much salt is liable to bring on cancer.

Some foreign scientists objected that African and South-East Asian peoples are not habitual drinkers of milk but do not have proportionately many cancer cases. Other foreign scientists endorsed Dr. Hirayama's view with experiments of their own.

Sixty medical scientists from 33 foreign countries and 100 Japanese attended the conference.

World Congress of Psychiatry

The Third World Congress of Psychiatry will be held in Montreal June 4-10, 1961, under the auspices of the Canadian Psychiatric Association and McGill University.

An estimated 3,000 psychiatrists, psychologists and other professional workers concerned with the prevention and treatment of mental illness and with related research are expected to attend the congress, which will attract representatives from 62 nations.

The first congress was held in Paris in 1950 and the second in Zürich in 1957, when psychiatrists from almost every country met to discuss and exchange ideas about schizophrenia, the illness which fills one-fifth of all hospitals beds throughout the world.

Australian Awards to Indian Nurses

Four nursing graduates from India are among those who have become Fellows of the New South Wales College of Nursing recently.

More than 500 people attended the investiture ceremony held in the Great Hall of Sydney University. The Lieutenant-Governor of New South Wales, Sir Kenneth Street, presided. The graduates received the distinctive red cloak with the College insignia which they had earned the right to wear.

The four Indian nurses, who had studied at the College under the Colombo Plan, were not present in person to receive their awards. They are: Sister Usha Seal (Calcutta Medical College) who studied Operating Theatre Technique in 1956; Miss Pritaum Kaul Bajwa (Punjab State), a Hospital Administration graduate; Mr. Coimbatore Subbaramayya Balasubrahmaniam (Government Hospital, Kurnool, Andhra) who studied operating theatre technique and hospital administration in 1955-56; Mr. Thomas Cherrivukalayil (Wanless Hospital, Miraj Medical Centre, Bombay) who won first-class honours in the operating technique and management certificate course in 1958.

Control of Leprosy in India

During the First Plan, the Government of India, in association with States, took two main steps for combating leprosy. The first was the establishment of Central Leprosy Teaching and Research Institute, in Madras, and, the second was the launching of a leprosy control programme in the highly endemic areas. By the end of the First Plan, four treatment and study centres and 29 subsidiary centres were set up. The Government of India subsidised State Governments by grants-in-aid to encourage the establishment of these centres. The Director of Leprosy Control Works ensured the co-ordination of the activities of the various centres through State Health Directorates.

During the Second Five-Year Plan the provision for leprosy control and relief to such patients is Rs. 4 crores. Sixty-six additional centres have been established by the end of September 1959 covering a total population of over one crore. Cent per cent grants are given to State Governments by the Centre against non-recurring expenditure for setting up control units, and 50 per cent for recurring expenditure.

It is hoped that by the end of Second Plan, besides facilities for special treatment, 100 centres for leprosy control will have been established.

A tentative provision of Rs. 7 crores has been made for the leprosy control programme during the Third Plan. By the end of the Plan, the number of leprosy control centres are expected to increase to 200 and that every hospital and primary health unit in the endemic areas would have been organised as a nucleus for leprosy control work. It is also proposed to associate a larger number of voluntary organisations and social workers in the campaign to fight this disease.

College of General Practitioners of India, Hyderabad

To meet the growing demand for providing academic education to the members of the medical profession engaged in general practice, the College of General Practitioners was opened on 4-9-60 at Hyderabad by the Minister of Health, Government of India. The College is temporarily located in the building of the Andhra Pradesh Branch of the Indian Medical Association. The college will mainly undertake to provide facilities to general practitioners for acquainting themselves with day to day advances in the various disciplines of medicine in collaboration with existing teaching institutions. It will not act as an examining body.

Revival of the Licentiate Course

The Working Committee of the Indian Medical Association views with alarm the proposal of the Planning Commission to revive the Licentiate Course in Medicine which was dropped several years back, to meet the apparent shortage of doctors.

The Planning Commission's approach to overcome the unwillingness of medical men to settle down in villages by recommending improved emoluments, provision of residence and educational facilities to their children is the right and proper approach and the Working Committee of I.M.A. feels confident that the above will meet to an extent the present needs of the country with regard to rural medical relief.

Deaths from Heart Failure in India

Concerned over the apparent rise in deaths from heart failure, the Indian Council of Medical Research is intensifying its study of the problem. After four years' research, the Council is understood to have arrived at some broad indications of the scope of the problem. These are, that sedentary occupations, obesity and diets

rich in fat content are contributory factors leading to heart attacks.

On the positive side, the findings suggest that exercise and regulated diet can, to a certain extent, counter the harmful effects of sedentary jobs, excessive fondness for certain types of fatty food and obesity have on the heart. While these indications are largely corroborated by research abroad, a phenomenon now under study is the possible role of large-scale infection caused by viral agents in producing heart diseases.

This problem is particularly urgent for two reasons: the alarming increase of infectious hepatitis—which was responsible for Delhi's jaundice epidemic—in towns and cities; and the fact that some recent cases of heart failure have been reported among comparatively young men. The critical age for susceptibility to heart attacks is placed at between 40 and 50. Medical experts are therefore wondering whether the temporary damage to the heart caused by infectious hepatitis actually increases a person's susceptibility to heart diseases.

While, by its very nature, the problem is one of long-term investigation, present research centred on establishing clinically the relationship between cholesterol in the blood and heart disease. It has been statistically established that raised cholesterol levels in the blood are associated with frequent heart diseases. But this evidence—similar to the relationship sought to be established between smoking and lung cancer—has yet to be substantiated.

Experiments being made on laboratory animals as a part of the I.C.M.R. programme have revealed that certain oils and fats, like pure ghee and vanaspati, butter and cocoanut oil raise cholesterol levels, while other oils and fats like unprocessed groundnut oil, sesame oil and saff flower oil lower them or maintain them at normal level. It does not, however, necessarily follow that regular intake of some fats leads to heart diseases, since there are numerous other factors involved.

Surveys of the problem of heart diseases made in two centres, Delhi and Agra, suggest that this is largely an urban affliction, and does not often affect women.

Birth Centenary of Late Sir Nilratan Sircar

A committee with Dr. B. C. Roy as president has been formed at Calcutta to observe the 100th birthday of the late Sir Nilratan Sircar, KT., who was an eminent physician and educationist. The committee—Nilratan Sircar Centenary Celebrations Committee—has planned a week's programme and proposes to create a trust to grant scholarships and stipends for medical and scientific studies. The Committee is also planning to publish his biography and a commemoration volume with contributions from a number of distinguished persons. Sir Nilratan was the first editor of the *Journal of the Indian Medical Association*.

BCG Vaccination Checks Leprosy

A pilot study sponsored by the Indian Council of Medical Research has shown that BCG vaccination offers immunity from leprosy.

The incidence of leprosy among BCG vaccinated children was investigated in a small selected area. Only five cases of leprosy developed among 678 such children in five years, whereas there were 283 cases of the disease among 1,651 children who had not been vaccinated.

In view of the far-reaching results of the discovery, a more comprehensive inquiry has been taken in hand.

Problems of the Deaf-Mute

At a meeting held in Calcutta on 25-9-60 in observance of International Day for the Deaf, the need for vigorous efforts by the Government to tackle the problem of deaf-mutes and to properly utilise their other faculties—usually stronger than those of normal people—was stressed by speakers.

Mr. R. C. Sen, Principal, Calcutta Deaf and Dumb School, felt the need for at least four more schools for people thus handicapped who numbered over 18,000 in West Bengal.

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Mr. Karmarkar, who was speaking on the occasion of the Third International Day of the Deaf at New Delhi said that the notion that the deaf or the dumb were useless was wrong. In fact they excelled others in certain arts and crafts, and must be given all encouragement. The Health Minister stated that the society had a responsibility to the disabled and it would be a good thing if employers all over the country made it a rule to employ some deaf and dumb persons in their establishments.

Mrs. Savitri Devi Nigam, president of the All-India Federation of the Deaf, said that the deaf and the dumb in the country numbered about 1,500,000. The Government must take some concrete steps to tackle the problem.

Medical and Public Health Services

Speaking at the Institute Day of the All-India Institute of Medical Services on 25-9-60, Mr. C. D. Deshmukh, Chairman of the University Grants Commission, said that all efforts to improve medical and public health services during the First and the Second Plan periods had not even touched the fringe of some of the pressing problems in those fields.

He suggested some drastic remedies like the nationalisation of medical services.

In India he said there was not only a shortage of medical men but also a serious maldistribution of doctors. While in the urban areas the doctor-patient ratio was 1:1,500, in the rural areas it was 1:30,000. In the advanced countries of the world, he said, the doctor-patient ratio was approximately 1:1,000. The overall figure for India was one doctor for every 5,000 patients.

Mr. Deshmukh said that medical education in India was the costliest, both from the point of view of an individual student and the State. He disclosed that each

medical student spent Rs. 2,000 per year in the college, while the State spent nearly the same amount on his education. This did not include the cost of hospital facilities.

Besides, the State has to incur a non-recurring expenditure of nearly one crore of rupees for opening an ordinary medical college. For opening medical institutes, like the All-India Institute of Medical Sciences, New Delhi, the expenditure was much more, he said.

Calcutta in Grip of TB Malady

The foundation stone of the fifth Chest Clinic building under the Mayor's T.B. Clinic and Domiciliary Treatment Fund, was laid by the Mayor of Calcutta, Sri K. C. Basu, at Layalka Ground, Bagha Jatin Colony in Tollygunge area on 24.9.60.

West Bengal Government leased out one-bigha plot of land at a nominal licence fee of Re. 1 annually for the Clinic building and the Union Rehabilitation Ministry will contribute Rs. 1,88,000 for the purpose. At present a two-storey building will be erected at a cost of Rs. 90,000.

Dr. B. C. Basu, Chairman, Standing Health Committee, Calcutta Corporation, referred to the menace of tuberculosis in West Bengal and said that in the city of Calcutta alone there were as many as 1,00,000 patients suffering from tuberculosis (positive cases) and the weekly mortality was on an average 40. He emphasised the need for the provision of adequate funds in the Third Five-Year Plan to check the spread of the disease.

More People Favour Sterilisation

People in urban and rural areas of Delhi have shown keen interest in the family planning programme. But there is a wide divergence in the acceptability of methods of planned parenthood.

A series of surveys conducted by the Family Planning Association reveals that the main reason retarding the progress in family planning is lack of education and superstition on the one hand, and economic backwardness on the other. Even those, who showed receptivity in the beginning, gradually lost interest. They find most of the contraceptives difficult to buy and cumbersome to use. More people, it is stated, are now in favour of sterilisation.

Silver Jubilee of K. G. Medical College, Lucknow

The K. G. Medical College is completing 50 years of its existence in 1960. It has been decided to celebrate the Golden Jubilee of this institution early in 1961. On this occasion the Old Boys Association of this college has decided to publish a calendar of this institution giving the names, qualifications, designations and addresses of all the graduates of this college. All graduates from the college and those having knowledge about an old graduate of this college are requested to send the necessary information immediately to the Secretary, Old Boys Association, K. G. Medical College, Lucknow for inclusion in the O.B.A. calendar.

CORRESPONDENCE

The Editor is not responsible for the views expressed by contributors

Certifying Surgeons in Tea Plantations

SIR,—As per Section 7 of the Plantations Labour Act, 1951, the State Government is to appoint certifying surgeons for all gardens in the State. We understand that there is a proposal of appointing qualified garden A.M.O.'s as certifying surgeons. We should have no objection to the proposal provided the already overburdened A.M.O.'s are allowed fees per examination for the extra workload.

I earnestly appeal to all members of Medical Advisory Board to consider it seriously to do justice to the profession. I am, etc.

Gohpur T.E. P.O. (DR.) S. R. DHAR
Darrang President, A.I.M.L.A., Assam Branch
Assam Member, Assam Medical Council

REVIEWS

Diagnosis in Locomotor Disorders—By Kenneth Stone, D.M. (OXON.), M.R.C.P. 1960, Oxford University Press, Mercantile Bldgs., Lal Bazar, Calcutta; 8½" × 5½"; pp. 224; 25s. net.

The author, from the Arthur Stanley Institute for Rheumatic Diseases, the Middlesex Hospital, deals in this handy monograph with the diagnostic problems in diseases of the locomotor system. Locomotor disorders embrace all symptoms pertaining to extremities, neck, thorax and spine. The differential diagnosis of these regions is discussed very lucidly and tersely in 16 chapters, as pain in different regions, oedema, spasticity, paraesthesia, polyarthritis, muscular atrophy, ataxy, involuntary movements, colour changes, bone tenderness and swelling, cramp, generalised aching, etc. Illustrative skiagrams, diagrams and charts, the 53 figures and the index are helpful.

The style is lucid and the get-up excellent. The volume will be useful as a quick reference work for orthopaedic surgeons, physicians and general practitioners.

K. S. BOSE

Active Alerted Posture—By W. E. Tucker, C.V.O., M.B.E., T.D., M.A., M.B.B.CH., F.R.C.S. E. & S. Livingstone Ltd., 16, 17, Teviot Place, Edinburgh; 8½" × 5½"; pp. viii + 64; 10s. 6d.

This short monograph deals with the method of maintaining active alerted posture and its advantages in preventing many types of arthritis, fibrositis and muscular rheumatism.

Correct and physiological posture has to be learnt, and this has been termed by Mr. Tucker as 'active

alerted posture'. It adds grace and enables a person to have more efficiency in work and sport and is certainly an important aspect of living in the modern world. It has been observed by J. W. Smith that people stood asymmetrically four times as often as symmetrically and developed slumping posture.

The book discusses in 6 chapters classification of posture, elementary principles of muscle physiology, elementary principles of mechanics of posture, postural attitudes, analysis of movements and effect of bad posture, and practical application of active alerted posture.

The style, get-up and illustrations are excellent. This handbook should be attractive not only to orthopaedic surgeons, but also to school teachers, general practitioners and physical instructors. Sports coaches and trainers will also greatly benefit by following the instructions.

K. S. Bose

OBITUARIES

Dr. M. Nageswara Rao

Dr. M. Nageswara Rao, L.M.P., expired following an attack of cerebral haemorrhage on 6-5-60 at Masulipatam. He was 59.

After passing the L.M.P. examination in 1923 from the Medical School at Visakhapatnam, he settled at Masulipatam as a general practitioner in 1924 and built up a lucrative practice. Besides being a popular general practitioner, he was an important public figure at Masulipatam. He was connected with various social service organisations like Krishna Club, Theosophical Society, Rotary Club, etc. An active and regular member of the Krishna District Branch of Indian Medical Association, he was its president and vice-president for a few years.

Dr. M. R. Kelkar

Dr. M. R. Kelkar, L.C.P.S., Medical Officer-in-charge, D.L.B. Dispensary died suddenly on 17-3-60 of cerebral apoplexy. He was 52.

Dr. Kelkar came to Kurduwadi in 1937 as a Medical Officer, D.L.B. Dispensary, Kurduwadi. In 1949 he was transferred but he resigned and started private practice. Again he joined D.L.B. service in 1957. He was popular with the public and also with the administration. He was a keen sportsman and took active part in all games. He was a founder-member of the Kurduwadi branch, I.M.A. and was twice elected its President. He was also the Chairman of the N. V. High School. His untimely death has been a great loss to the general public of Kurduwadi and surrounding villages.

Dr. D. G. Mokadam

Dr. D. G. Mokadam had a very distinguished school and college career. He passed the M.B.B.S. examination from G. S. Medical College, Bombay, in 1936. During his college career he took keen interest in various sports activities. After graduation, he spent about 2 years in various hospital posts, in Bombay. He then joined the C. P. Medical Service, and was in charge of various hospitals in the old Madhya Pradesh, during which time he took great interest in surgical work.

He resigned from service and opened a surgical home in Nagpur in the year 1952. He obtained the M.S. degree from Bombay the following year and within a very short period made his mark as a surgeon. He was attached to the Mayo Hospital, Nagpur, as Honorary Surgeon for 2 years, and was Honorary Surgeon to Mure Memorial Hospital till his death.

He took keen interest in the activities of the Indian Medical Association and was its President for 2 years between 1956-58. He passed off on August 2, 1960, after a short illness. In his death, Nagpur has lost a very promising, good-natured and skilful surgeon.

Dr. M. Nageswara Rao

Dr. M. R. Kelkar

Dr. D. G. Mokadam

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SUPPLEMENT
Journal of the Indian Medical Association

VOL. 35, No. 9 CALCUTTA NOVEMBER 1, 1960

XXXVII ALL-INDIA MEDICAL CONFERENCE—CHANGE OF VENUE

The following resolutions were passed at the Special Requisition Meeting of the Central Council of the I.M.A. held at Delhi on October 9, 1960.

1. "It is resolved that the decision adopted at the 20th Annual General Meeting of the Central Council of the Indian Medical Association held at Indore in December, 1959, to hold the 37th All-India Medical Conference at Gauhati sometime in December, 1960, is hereby rescinded. It is further resolved that the 37th All-India Medical Conference will be held at a place outside the State of Assam."

2. "Resolved that the Central Council empowers the President and the Honorary General Secretary to select the venue and the date for the 37th All-India Medical Conference."

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With reference to the above resolutions, the hony. general secretary, I.M.A. issued the following circular to the hony. secretaries of all State/Territorial and Local branches of I.M.A.

"In view of the Central Council having decided at its Special Requisition Meeting held on October 9, 1960 at Delhi, to hold the next All-India Medical Conference somewhere outside the State of Assam, it is requested if you could kindly inform this office, *latest by the 25th of October, 1960*, whether your branch would be prepared to invite the Conference scheduled to be held this year *in December, 1960*.

"In case it be not possible for your branch to hold the Conference in the X-mas week of 1960, please indicate how soon after that it could be possible to do so."

I.M.A. ON THIRD 5-YEAR HEALTH PLAN

OBSERVATIONS AND RECOMMENDATIONS

The Indian Medical Association whilst considering the *draft outline of the Third Five Year Plan, with respect to health*, kept in view the recommendations of the Bhore Committee which were published in the year 1946. It is well known that though the recommendations of the Bhore Committee were very comprehensive both as regard the long-term and the short-term programmes, very little had been done in context of these recommendations in the intervening period. The health problem was again taken up for consideration with some seriousness with the inauguration of the First Five Year Plan and its consideration continued through the First and Second Plan periods. The overall improvement during the last fourteen years, has not been such that the nation can be proud of. It could be said that some improvement would have in any case taken place even if no planning was done.

The *broad groups* in which the *health programme* in the Third Plan is proposed to be tackled cover all the fields which should be included in any plan. The statement that "as a result of measures undertaken during the First and Second Plans there has been some improvement in the health conditions of the people generally which is reflected in the lower incidence of disease, decrease in infant mortality, general decline in mortality rates and increase in the expectation of life" is by itself a guarded statement because of unavailability of statistics to prove the statements made. Therefore, unless and until, conditions are established for obtaining vital statistics in as detailed a manner as possible, the nation would never know how much improvement has taken place in its health.

The Indian Medical Association whilst considering the draft outline of the Third Five Year Plan felt that the 2% per year *increase in the population of* the country appears to mop up the improvement in the services, which the planners are able to bring about. Therefore, unless and until the rate of population increase is not lowered the various plans particularly their health section will not be able to catch up with this factor of increase of population.

The *financial outlay* for health in the third Five Year Plan does not appear to be sufficient to provide the services which are envisaged under the plan. This statement is made with at least two factors in the background. Firstly, the outlay is less than what it was under the Second Five Year Plan and secondly, the purchasing power of the rupee is steadily going down, thereby making the services more and more expensive.

The Indian Medical Association is strongly of opinion that at least 15% of the total outlay on the 3rd plan should be earmarked for health programme. The National Development Council, on the other hand, has sanctioned about 4.3% (i.e. Rs. 300 crores) in place of 5.8% provided in the 2nd plan. This is definitely a retrograde step, a non-realisation of the health need in total planning. The apparent reason obviously is non-availability of finances.

Considering the individual items as listed on page 109 of the draft outline, the first priority has been given to

I. *Water Supply*:

(a) *Rural Water Supply*: The admission that "because of the widely dispersed nature of the problem it is not always easy to obtain statistics showing the extent to which safe water supply has been provided in rural areas" shows that assessment of improvement in the rural water supply cannot be made for a long time to come, because of the conditions of the problem as stated in the question above. First plan sanctioned 228 urban and 134 rural schemes, but there was no satisfactory progress and the bulk of the money carried over to the 2nd plan. Most of the schemes now in progress were sanctioned 2-3 years ago. Second plan provided 83 crores for urban and 23 crores for rural water supply and 10 crores for Corporation (altogether 91 crores). Second plan progress report available, showed outlay of only 38 crores altogether. The position is neither clear nor satisfactory. It is, however, quite legitimate for the Central Council of Health, and with which we entirely agree, to demand that during the 3rd plan period, rural water supply scheme should not only get top priority but must be completed as far as practicable. The Indian Medical Association recommends that in those States where Public Health Engineering Departments do not exist at present, steps should be taken to set up these departments under the Directorate of Health Services. It also

recommends that each State should maintain maps of schemes and suggests of development of the rural water supply. It also recommends that there should be much greater liaison between the different authorities working towards improvement of the rural water supply.

(b) *Urban Water Supply*: The Association is in complete agreement with the suggestions made in the draft outline with regard to phasing of the urban water supply schemes, so that different parts of the project are in the correct sequence with one another and at each stage certain returns on the outlays incurred are realised etc. etc. But here again we wish to emphasise that unless and until there is closer contact between the different services of municipalities such as the water supply departments, the sewage departments etc. etc., difficulties in carrying out the schemes will arise in the absence of such contact. Therefore the observation that "water supply and drainage should wherever possible be taken up as co-ordinated programmes" is commended.

II. *Primary Health Units, Hospitals and Dispensaries*:

The programme for establishing primary health units has been integrated with the scheme of Community Development. This integration may be useful at the time such health units are first established but placing these units under the Block Development Officer of the Community Project Department should not be done. This practice is not conducive to satisfactory working of the primary health units because the Block Development Officer being a non-medical man cannot be expected to understand the problems of the doctor in-charge of the Health Unit.

The present availability of hospital beds in general hospitals in the country is about 0.38 bed per thousand of the population. The target for the Third Five Year Plan should be one bed per thousand of the population, thereby, *there should be 4,00,000 beds at the end of the Third Five Year Plan and not 1,90,000 beds as envisaged in the plan.* It should be remembered that there would be a 10% increase in the population during the Third Five Year Plan and taking the population figure at the end of the Third Five Year Plan at 44 crores and provision of 1,90,000 beds will mean 0.43 beds per thousand at the end of the Third Plan or 0.05% increase in five years amounting to 0.01% per year. With this meagre increase in the bed strength, it will be impossible to improve the hospital services during the Third Five Year Plan period. Leaving all other reasons aside this one factor alone demands an increase in the outlay of the Third Plan for health purposes to a considerable degree than the Rs. 300 crores now proposed to be allotted. The Association whilst considering the question of construction of new hospitals feels that the preliminary requirements such as acquisition of land and material for the building etc. should be fully assured, so that target dates for completion of scheme would be fixed and no delays incurred after the construction of a hospital had started. The Association is of the opinion that very big hospitals should not be constructed. The average district hospital should be a 500-bed hospital and should provide for a population of about 2 million people. The possibility of such a hospital becoming a teaching centre in the future, should be kept in view.

III. *Communicable Diseases*:

(a) Whilst agreeing with the measures taken for control of Malaria and Filaria, the Association observes that though in the initial stages, there may be separate programmes for control of these two diseases but gradually there should be complete integration of *Malaria and Filaria* eradication and they should be brought under one integrated programme.

(b) The Association regrets to know that in spite of the best possible efforts "recent surveys suggest that while mortality from *tuberculosis* is showing signs of decline, the incidence rate has remained more or less the same, both in cities and in villages". These observations lead to irrefutable conclusion that the number of tuberculosis patients is growing day by day and treatment of this disease through domicilliary chemotherapy has to be adopted as a necessity because of lack of hospital beds.

The statistics with regard to B.C.G. have not been maintained as they should have been. Therefore a study of the usefulness of this measure in the context of Indian conditions cannot be made. In areas where B.C.G. vaccination was done on a mass scale 10 years ago and not repeated a new generation of 1 to 10 year olds has now come up who have no protection against tuberculosis. This observation shows that *B. C. G. vaccination programme should be a continuous effort* and not done in fits and starts. The Association once again emphasises the colloboration which the private practitioners could give to the authorities in carrying out mass B. C. G. vaccination, given the proper approach.

(c) *Smallpox*:

Time has now come for enactment of suitable legislation for compulsory vaccination against smallpox. This Association would at this stage reiterate its resolution passed at the 36th All-India Medical Conference:—

> "This Conference while appreciating the decision of the Central Council of Health to eradicate smallpox in the shortest possible time through a centrally sponsored scheme, wishes to draw attention to the fact that ways and means of its complete eradication are so very well known that it is wastage of public funds to start pilot schemes and commissions for this purpose. All that is necessary is the application of accepted methods for the control of the disease and the proper discharge of their responsibilities in this behalf by various State Governments".

The Association would also recommend improvement in the transport and storage facility for the vaccine-lymph.

(d) The deaths from *Tetanus, Diphtheria* and *Whooping Cough* could be prevented by administration of triple antigen. Here again co-operation from private medical practitioners should be sought to make this programme a success.

(e) *Other diseases*:

Measures for control of other diseases such as *Goitre, Trachoma* and *Cholera* are needed, as much as for control of *Typhoid* and other types of *Gastro-enteritis*. In the case of incidence of cholera and typhoid, preventive measures may successfully be taken in conjunction with those for Diphtheria, Tetanus and Whooping Cough in the younger age groups.

IV. *Public Health Services*:

In the draft outline of the III Five Year Plan, due consideration does not appear to have been given to the Public Health Services. No doubt, it is true that the various items mentioned under this heading cover the fields which come under the purview of Public Health Services, but it has not been indicated as to how all this would be achieved. It has also to be noted that the question of nutrition, particularly of the younger age groups, should receive much more attention than appears to be envisaged. The Association recommends that co-operation from the independent medical profession should be sought on proper basis to carry out some of the items which need services of a large number of trained personnel such as School Health Services etc. etc.

V. *Training Facilities*:

No doubt, the number of medical colleges would have gone up to 58 in the year 1961 and the corresponding

annual intake to over 5000 per year, the number of doctors required at the end of the III Five Year Plan period would not be met even from this expansion. This paradox still gets complicated when we find that the doctors who are trained in these colleges, cannot be adequately utilised. The argument which has been offered now and again, that the young doctors are attracted to the urban areas and would not settle down in rural areas, should be fully analysed. On analysis, it is found that the Government is quite aware that there are several reasons for this, namely, that the inducement and facilities offered to the young doctors to work in rural areas, are not adequate in more than one way. The salary offered is such that it is not enough inducement for them to go to a village. It is well known that conditions of transport, housing and children's education are practically non-existent and to expect a doctor to settle down for whole of his life under such circumstances is asking the impossible. "To attract more doctors to rural areas, consideration may have to be given to a minimum period of service in rural areas being a condition of public services" is not the correct approach to the problem. It has many drawbacks because if a fresh graduate is placed in a position where he is to make independent diagnosis and also treat the patient on his own initiative, it cannot be expected of him to be able to do justice either to himself or to his patient. The Association has no objection to a young doctor being attached to a senior doctor for a number of years so that he picks up the methods and conditions under which he has to work. "Consideration may also have to be given to the provision of incentives for service in rural areas in the form of improvement in emoluments, grant of non-practising allowance, provision of residential accommodation and other amenities and grant of assistance and facilities for further studies". This would be the correct approach to the problem.

The Association recommends that serious consideration should be given to the question of pay scales of doctors. Unless and until the pay scales are improved, the problem will never be solved. (Recommendation of the I.M.A. on this behalf has already been forwarded to all concerned.)

The idea of re-starting Licentiate Course is preposterous particularly if at the same time it is envisaged that opportunity would be given to all these Licentiates to undergo further training and appear for University qualifications. It presupposes that such a licentiate would have already done his Intermediate with Biology. It cannot be too strongly condemned because the Licentiate Course would be of also five years' duration. The Association again reiterates its resolution passed at its Working Committee meeting recently.

> "The Association views with alarm the proposal of the Planning Commission to revive the Licentiate Course in medicine to meet the apparent shortage of doctors. It has been definitely accepted by Government that there should be only one standard of medical qualification and that is the University Degree. The Licentiate Course has been dropped for over several years now and facilities have even been offered to Licentiates to qualify for the Degree. The Association strongly opposes the recommendation of the Planning Commission and requests that the proposal be dropped once for all".

The Association fails to understand as to what would be achieved by this wastage of time and energy unless it be the Government's intention to produce doctors whom they could employ at a lower salary.

The figure of 5000 entrants to the medical colleges in 1961 should be considered in relation with the number of failures at the end of the course and thereby the wastage which occurs. It has been mentioned that approximately 40% of those who join the medical colleges, fail to qualify. The causes of this sort of state of affairs should be found. The Association feels that there is something seriously wrong in the method of admissions, teaching, curricula and examinations. Too much is included in the curricula of medical training that the student is permanently confused for the time he is studying in the medical college. Unless and until there is thorough revision of curricula and method of teaching and examination, this deplorable state of affairs will continue. It has also to be brought to the notice of the authorities that the new medical colleges which have been allowed to start courses, in a great majority of them, in spite of passage of 3-4 years, even some elementary facilities for teaching do not exist. The practice of opening new medical colleges with its students attached to a far-off medical college till the new college can provide facilities under his own aegis, should be condemned. It has also been noticed that admissions to the medical colleges are allowed to be increased without consideration of the fact that big classes are detrimental to proper training, particularly when no addition is made to the teacher-student ratio, quantum of equipment available and general lack of facilities in the college.

In view of shortage of foreign exchange and high cost of books and journals, the Government should devise methods for Refresher Courses for doctors who would like to undertake such further training.

VI. *Indigenous Systems of Medicine*:

The Association has all along maintained that it is no use flogging a dead horse, the Indigenous Systems of Medicine. It is difficult to comprehend as to why the Government is wasting good money in encouraging systems of medicine which have outlived their usefulness. This question of indigenous system has also to be considered from the aspect of control of communicable diseases. If it is realised that methods like B.C.G. vaccination, smallpox vaccination, triple antigen, malaria and filariasis are accepted scientifically, then how can the Government start systems which do not believe or are actively antagonists to these accepted principles of prophylaxis.

At this time the Association would like to touch upon the experiment of "integrated medicine". It appears that in spite of failure of this integration of modern scientific medicine with the indigenous system, the Government has not still given up this idea.

VII. *Family Planning*:

The programme for Family Planning would bog down if it has not already done so in red tape. It can be asserted that no progress whatsoever has been made to tackle the actual problem. 6.5000 sterilisations done in the period 1956-60 would not appear even to touch the fringes of the problem. The large number of contraceptives issued during the same period and the expenditure involved in these sterilisations, if computed in relation with the expenditure incurred on the Family Planning Programme during this period, would show that fantastic amount of money had gone down the drain. This programme, if it is to make any appreciable change in the rate of population growth, has to be a dynamic programme. We can quote a large number of instances where clinics and individual doctors with all good intentions, have approached the authorities for support and encouragement in carrying out what they called, was useful for the nation but due to dedays and red tape, their efforts came to nought.

The Indian Medical Association had submitted a pilot scheme offering its co-operation through its branches. This Scheme was duly approved of by the Health Department, Government of India and recommended to the States. The Association is still awaiting some signs of its implementation. It appears that only one State has paid some heed to the directives given by the Centre. The Association is sure that no progress will be made if things are carried on in this manner.

VIII. *Housing* :

It appears that when housing schemes for various groups are implemented, due consideration is not given to simultaneous development of roads, sanitary services, water supply, electricity etc. leading to formation of new *slums*. Unless and until all these factors are taken up simultaneously, no housing schemes should at all be implemented.

IX. *Drugs* :

It is an accepted fact that high cost of drugs is a great hindrance to the availability of proper scientific medical aid, particularly in private capacity. The Pharmaceutical Enquiry Committee set up by the Government of India in 1953 suggested certain measures to make the country self-sufficient in this direction. It is gratifying to note that the authorities have taken some steps to initiate manufacture of antibiotics, synthetic drugs, alkaloids and surgical instruments. It is noted that no plant is yet set up for making "intermediates".

Petrol chemicals are being increasingly used by advanced countries and there is no reason why a plant for manufacture of such chemicals be not established in connection with one of the refineries in the public sector. The Association would urge upon the Government that it should take all possible steps to produce as many drugs as possible in the country in order to cheapen the cost of treatment.

BRANCH NOTES

ALIGARH BRANCH—A meeting was held on 23-7-60 with the DMOH in the chair, 17 members being present. After the election of president and 3 vice-presidents of IMA, Dr. R. K. Maheshwari read a paper on The Rational Use of Antibiotics in Medical Practice. A discussion followed. A dinner brought the meeting to a close.

An emergent meeting was held on 5-8-60 under the chairmanship of Dr. S. B. Lal, 14 members being present. It was resolved to hold a meeting of citizens to arouse consciousness about the cholera epidemic. Dr. B. R. Shukla offered the services of the Gandhi Eye Hospital and Institution Laboratories for sterilisation of saline.

The meeting was followed by a tea party.

At a public meeting held under the auspices of the branch (date not mentioned) presided over by Dr. S. B. Lal, it was resolved that : (i) The branch should publish 10,000 leaflets giving instructions for the prevention of the spread of cholera; (ii) Each member of the branch should contribute Rs. 10/- to the cholera fund; (iii) Members should collect funds for cholera prevention; (iv) Members of the branch should supply medicine and offer other help to IDH.

ANAMALLAI BRANCH—A meeting was held on 21-5-60. Dr. N. S. Menon was in the chair, 11 members were present. After routine business it was prepared to give a present to Dr. E. Harris in honour of his marriage. Dr. A. Sreenivasan gave a talk on Syphilis, appended by recent advances on the subject by Dr. Jayachandran. The members were entertained to tea by Dr. (Mrs.) Jayakumari Pillai and Dr. Padmajan Pillai.

A meeting was held in 18-6-60 with Dr. N. S. Menon in the chair, 9 members being present. A letter received from the Hony. Secy., Anamallai Planters' Association regarding the National Malaria Eradication Programme was considered. It was decided to extend help and co-operation to the field staff subject to certain condition. Dr. R. Gopalakrishna gave a talk in some Public Health Aspects in Estates. Tea was kindly given by Dr. and Mrs. Razak.

A meeting was held on 23-7-60. Dr. N. S. Menon presided, 15 members being present. The meeting started with the presentation of the marriage gift to Dr. E. Harris and welcoming of Dr. Mrs. Queenie Harris. Later Dr. N. S. Menon gave a talk on Diabetes Mellitus. Tea was provided by Dr. and Mrs. K. John.

BAZALI BRANCH—A general meeting was held on 25-9-60. Dr. H. D. Choudhury presided; 8 members were present. The following office-bearers were elected : President—Dr. L. D Sarma; Secretary—Dr. D. C. Das; Asst. Secretary—Dr. T. C. Goswami. The audit report was presented and accounts passed up to 31-7-60. It was resolved to contribute Rs. 5/- per year to the local fund.

BELLARY BRANCH—At the annual general meeting held on 17-9-60, the following office-bearers for 1960-61 were elected :

President—Dr. J. J. Dharmaraj; Vice-President—Dr. J. Kamala; Hony. Secretary—Dr. U. K. L. Narayana Rao; Jt. Secretary—Dr. K. Basavanagoud; Representative to Central Council—Dr. T. Y. Narayana Rao.

Dr. J. Dharmaraj spoke on Management of Enlarged Prostate.

BIJAPUR BRANCH—On 10-1-60 Dr. A. N. Baliga of Bombay gave a talk on Acute Abdomen in Children and Adults. Dr. Mangalvedhekar was in the chair. Thirty members attended.

On 29-1-60 a film show on Varidax and Diamox was arranged. Sixteen members were present. On 6-3-60, a social gathering was held at Bagalkot, 60 miles away. Twenty members participated. On 19-6-60, Dr. Lohakare of Sholapur gave a talk on Early Diagnosis of Cancer. Dr. Mangalvedhekar presided. On 21-8-60 Dr. V. D. Kirpeker gave a talk on his Impressions of Foreign Tour. Dr. Mangalvedhekar presided, 21 members being present.

BOMBAY WEST SUBURBAN BRANCH—A party of 24 members visited the Cipla Laboratories Ltd. factory in Bombay on 11-8-60 and another party of 20 on 12-8-60. They were shown round the various departments and entertained to refreshments by the management.

A general body meeting was held on 4-9-60. More than 60 members were present. Dr. S. C. Sheth, President, was in the chair. Dr. (Miss) H. S. Vakil spoke on Some Recent Advances in Diagnosis and Treatment on the Diseases of the Eye encountered in General Practice, with particular reference to Trachoma and Cataract. By courtesy of the British Council, Bombay, the following films were shown : Jet Circle—a film on jet plane travel; Physiology of Human Reproduction; Lower Segment Caesarean Operation.

A managing committee meeting was held on the same date to transact routine business.

COIMBATORE DISTRICT BRANCH—A meeting was held on 20-8-60. About 100 members were present. Dr. D. Sundareswaran, President, was in the chair.

Election of the President and two Vice-Presidents of the Madras State Branch was held.

Dr. K. S. Sanjivi, retired Professor of Madras Medical College gave an elaborate talk on Modern Therapeutics.

DEHRI-DALMIANAGAR-SASARAM BRANCH—A meeting was held (date not mentioned) with Dr. J. N. Singh in the chair. Sixteen members attended. This meeting-cum-picnic was attended by many ladies and children. Dr. Ishaque presented the account of the Building Fund of the Branch It was decided to start the work of construction at the earliest. The Fund stood at slightly over Rs. 3,000/-.

DEOLALI BRANCH—The annual general meeting was held on 29-9-60. Dr. B. J. Pandit was elected president and Dr. M. T. Mane as Hony. Secretary. Brig. R. Bukshi (Area Commander) was the guest of honour.

DIBRUGARH BRANCH—A meeting of the branch was held on 19-8-60. Dr. G. S. Das of Gauhati was in the chair. Nine members and 3 guests were present. The chairman gave a detailed account of the progress made

for holding the next All-India Conference at Gauhati in December. Members participated in the discussions.

The following office-bearers were elected in the vacancies caused by death and transfers:

President—Dr. S. N. Sarma; Vice-President—Dr. K. L. Ghose; Jt. Secretary—Dr. J. Choudhury.

At a special meeting held on 13-9-60 under the Chairmanship of Dr. K. L. Ghose, resolutions expressing "satisfaction over the continued peace and tranquillity among different sections of the people including students", urging in view of this, students of the Assam Medical College who had left "to return to Dibrugarh and join their classes" and "expressing satisfaction at the speed with which normalcy has been restored" were adopted.

ERODE BRANCH—A meeting was held on 31-5-60, Dr. R. S. Venkataraman presiding; 25 members were present. Dr. C. N. Santhanam of Coimbatore spoke on Tumours in the Right Iliac Fossa.

On 3-8-60 a dinner meeting was addressed by Dr. T. M. A. Pai, Registrar, Academy of General Education, Manipal. Dr. Pai insisted on the maintenance of the highest standards in medical colleges and in clinical teaching.

Drs. M. M. Shenoy and M. N. Shenoy entertained the guests to dinner.

A meeting was held on 13-8-60. Dr. (Miss) P. Greeves presided. Dr. K Mahadevan spoke on Ophthalmology and General Practitioners.

The election of the President and two Vice-Presidents of the Madras State Branch was held.

GONDAL BRANCH—The following office-bearers for 1960-61 were elected at the annual meeting held on 25-9-60: President—Dr. M. V. Badheka; Vice-President—Dr. R. P. Kamdar; Hony. Secretary—Dr. K. J. Upadhyaya.

The annual report states that meetings had been held regularly and examination of school children continued. Membership stood at 12.

GUDIVADA BRANCH—At a meeting on 20-9-60, the following office-bearers for 1960-61 were elected: President—Dr. N. Visweswara Rao; Vice-President—Dr. G. V. Raghava Rao; Secretary—Dr. P. L. Narasimha Rao; Jt. Secretary—Dr. K. Venkateswara Rao.

GUMLA BRANCH—A meeting was held on 14-9-60. Election of President and 3-Vice-Presidents of state branch was conducted. Two new members were enrolled. A lively discussion on surveillance party of malaria eradication was initiated by Dr. Md. Tauheed. Resolutions were adopted enjoining that civil Asst. Surgeons of the Bihar State Medical Service should be given free quarters; requesting government to review pay scales of Medical Officers and bring them at par with other States; urging the inclusion of all District Board Medical personnel to be included in State Medical Cadre; desiring that no sales tax be charged on medicine sold by medical practitioners to their *bonafide* patients; and that there should be no control by Drug Inspectors and the Drug Control Act on dispensaries run or owned by medical practitioners where medicines are sold only to *bonafide* patients.

GWALIOR BRANCH—The annual conference of the branch was held on 17th and 18th September, 1960 at the Assembly Hall of the G. R. Medical College. About 200 medical men, including members, attended. Dr. A. S. Mishra, President of the branch welcomed the guests and members in a short speech. Dr. G. S. Wagle, President of the Madhya Pradesh State, inaugurated the conference. In his address Dr. Wagle described the aims and objects of the I.M.A. and said it should give more strength to be really representative. He thought membership of the I.M.A. should be obligatory with registration. He also appealed for contributions to the Central Building Fund.

Drs. R. Raman, D. V. Datta, R. S. Dharkar, C. P. Tiwari, Mrs. I. Bhonsle, B. P. Sayena, Kawthekas and Major Krishnamurty took part in the scientific session.

At the business meeting held later, the following office-bearers for 1960-61 were elected: President—Dr. A. S. Mishra; Vice-President—Dr. S. N. Saxena; Hony. Secretary—Dr. B. S. Kale; Hony. Jt. Secretary—Dr. Kamal Kishore.

The business meeting was followed by an excursion to Shivpuri 72 miles away.

The annual report presented by the Secretary states that membership rose from 37 to 64. Five monthly meetings, 1 special meeting and 2 executive committee meetings were held. Three lectures and cinema shows were arranged.

HOSHIARPUR BRANCH—The following office-bearers were elected at the annual general meeting held on 3-7-60 under the chairmanship of Dr. S. L. Nanda; President—Dr. M. L. Bhaggana; Secretary—Dr. P. N. Sad; Jt. Secretary—Dr. M. L. Laroia; Representative to Central Council—Dr. M. S. Pal.

JABALPUR BRANCH—At the annual general meeting held on 11-9-60 under the chairmanship of Dr. S. S. Shrivastava the following office-bearers for 1960-61 were elected: President—Dr. T. P. Niyogi; Vice-Presidents—Dr. M. P. Mishra, Dr. R. N. Chatterjee, Dr. Venkataraman; Hony. Secretary—Dr. G. K. Tiwari; Hony. Jt. Secretaries—Dr. Mrs. Lele, Dr. M. M. Shrivastava, Dr. D. K. Gupta; Hony. Treasurer—Dr. N. Haldar.

JAHANABAD BRANCH—The following office-bearers were elected at the general meeting held on 31-8-60; President—Dr. A. Haque; Vice-President—Dr. N. G. Sinha; Hony. Secretary—Dr. J. Prasad; Jt. Secretary—Dr. K. P. Sinha.

JAIPUR BRANCH—A meeting was held on 15-9-60 to mourn the sad, sudden and untimely death of Col. Dr. Gur Bux Singh, one of the oldest members of the branch.

JAMSHEDPUR BRANCH—At the scientific meeting held on 30-8-60, Dr. H. Rahman gave an elaborate talk on Bony Injuries of the Forearm illustrated with typical skiagrams. Lt.Col. A. F. Lasrado discussed his experiences in such complications and Dr. P. B. Bharucha elucidated the talk. The meeting ended with a dinner.

KAKINADA BRANCH—On 7-12-60, Dr. K. C. Nambiar of Stanley Hospital, Madras, spoke on the Role of a General Practitioner in the Field of Neurosurgery. Dr. P. N. Rao was in the chair. The meeting was followed by a dinner in honour of the distinguished speaker.

On 25-6-60, Dr. K. Meenakshi spoke on Dysfunctional Uterine Bleeding. Dr. N. Ammannapantulu was in the chair.

On 30-7-60, Dr. K. Pitchia spoke on Cerebral Vascular Accidents. Dr. P. N. Rao presided.

On 20-8-60, Dr. C. Sundararama Sarma spoke on Diagnosis and Treatment of Glaucoma. Dr. P. N. Rao was in the chair. Dr. D. Gopalaswamy demonstrated three cases of Tuberculous Meningitis treated with hydrocortisone with usual anti T.B. management. A case of Tumour Scalp was put up for discussion.

KHAMGAON BRANCH—The following have been elected (date of election not given) office-bearers for 1960-61: President—Dr. P. G. Ekbote; Vice-President—Dr. W. B. Adbe; Hony. Secretary—Dr. K. N. Agarwal; Hony. Jt. Secretary—Dr. T. K. Nagda.

The Secretary in his annual report for 1959-60 states that membership stood at 18 in the beginning of the year; one joined and 3 left due to transfer. Altogether there were 14 meetings, of which 8 were clinical. At the World Health Day celebrations on 7-4-60, Drs. V. R. Sane and S. P. Budhe gave interesting talks on malaria eradication. The annual dinner was held on 24-4-60. A journal club was started for July 1960.

KOTHAGUDIUM BRANCH—A clinical meeting was held on 19-8-60 at the Main Hospital. The Matron, Sister-in-Charge, Operation Theatre and several nurses were present in addition to most of the members.

Dr. T. S. Ganapathy described a fatal case of snake bite. Dr. K. R. Chandrasekhar described a case of complete Prolapse Rectum. A case of plating in compound fracture done by Dr. T. C. Ramchandani was shown. A case of intestinal Obstruction was demonstrated. Dr. H. M. Jagannath Rao demonstrated an interesting heart case. A case of fracture spine was demonstrated.

MADRAS CITY BRANCH—A special general body meeting was held on 6-8-60. Elections were conducted for President and 3 Vice-Presidents of Central I.M.A.

A resolution was passed requesting the Madras Government "to consider the members of the medical profession as carrying on an essential profession from the point of view of Rent Control Act".

The feasibility of the city branch forming into a territorial branch was discussed and a sub-committee was formed to study the question and report to the general body.

At a clinical meeting held on 27-8-60, under the chairmanship of Dr. G. Sriramulu, Prof. Dr. P. De Nicola of the University of Navia, Italy, gave a talk on Physiologic Investigations and Clinical Experience concerning the Treatment of Chronic Hepatitis and Liver Cirrhosis. The meeting came to a close after a vote of thanks to the distinguished speaker.

The election of President and 2 Vice-Presidents for the Madras State Branch was conducted at a special general body meeting held on the same day.

A meeting of the executive committee was held on 22-8-60 under the chairmanship of Dr. G. Sriramulu. Active co-operation in the membership campaign was pleaded for by the President and the Secretary. Nine new members were admitted.

After several routine business had been gone into, Dr. K. Rama Rao brought before the committee the difference of pay for licentiates in government and corporation services. A resolution was passed requesting the government of Madras "to treat medical licentiates with 10 years' standing on a par with medical graduates in the matter of new pay scales.

MADURA BRANCH—A meeting was held on 20-8-60. Dr. K. Ramchandran presided. Election was conducted of President and 2 Vice-Presidents of the Madras State Branch. Dr. P. N. Rangiah gave a lecture on Titbits from Dermato-Venereology Department.

MEERUT BRANCH—A general meeting of the branch was held on 28-6-60. Twenty-one members with one guest were present. After the routine business was over, Sri K. N. Saxena, Government Regional Psychologist gave a talk on Behavioural Disorders in Children and Therapeutic Measures. The meeting requested the U.P. Government to have the export of milk and its products so that the poorer section of the people might buy these at cheaper rates.

A symposium meeting was held on 10-5-60. Thirty-one members with 2 guests were present. Col. M. Tajumuddin presided. The following doctors spoke on different aspects of the subject of Bronchial Asthma.

1. Dr. C. M. Gupta on Aetiology; 2. Dr. S. B. Vyas on Pathology; 3. Dr. J. L. Caroli on Clinical Manifestation of Asthma; 4. Dr. R. S. Seth on Diseases of Upper Respiratory Tract in relation to Bronchial Asthma; 5. Dr. Ujagar Singh on Treatment and 7. Dr. O. P. Goel on Differential Diagnosis. The President concluded the symposium with the following points. "In Aetiology sensitiveness of the tissues, psychogenic factors, allergy to certain foreign proteins must be kept in mind. Regarding treatment, presence of secondary infection should be sought for and adequately treated with antibiotics. Use of corticosteroid is very useful during acute stage. Auto-vaccines are useful in certain cases. Use of corticosteroid nasal drops if there is sneezing may stop the attack. Oxygen should be used with caution in Status Asthmaticus as its constant use lowers the CO_2 stimulus to respiratory centre. Use of Morphine or Pethidine is questionable.

The 13th anniversary of India's Independence was celebrated by the branch on 15-8-60. The function started with the Vande Mataram song. The President Dr. A. S. Maheshwari unfurled the national flag followed by Jhanda Geet and the National Anthem. Drs. J. L. Caroli, K. C. Anand and K. G. Mittal made suitable speeches. Other items included Ramayana path, music and songs by children of doctors. Children were awarded prizes on their performances. Prizes were also awarded as declared on the occasion of the Holi. The former prizes were donated by Dr. K. G. Mithal and those for Holi by Drs. J. L. Caroli and K. G. Mithal. Members and guests who numbered about 125 were entertained to tea by the branch.

A general meeting was held on 28-8-60, with Dr. A. S. Maheshwari in the chair. Four guests and 20 members were present. After routine business, Dr. K. R. Mahajan spoke on Syncope.

MONGHYR BRANCH—At the annual general meeting held on 4-9-60 the following office-bearers for 1960-61 were elected: President—Dr. K. P. Mitra; Vice-Presidents—Dr. J. Prasad and Dr. L. Prasad; Hony. Secretary—Dr. B. Dutt; Hony. Jt. Secretaries—Dr. J. Bhagat and Dr. J. Prasad; Hony. Treasurer—Dr. B. N. Banerji; Representative to Central Council—Dr. B. B. Bose.

MORADABAD BRANCH—The annual meeting was held on 25-9-60. Dr. J. S. Agarwal presided. A symposium on Coronary Thrombosis was initiated by Dr. D. P. Manchandra. Dr. J. S. Rastogi, Dr. R. D. Gupta and Dr. Harnam Singh participated.

The following office-bearers were elected for 1960-61: President—Dr. Hansraj; Vice-President—Dr. J. S. Rastogi; Hony. Secretary—Dr. V. P. Rastogi; Jt. Secretary—Dr. R. D. Gupta; Treasurer—Dr. G. Mujtaba. Members and guests were entertained to a dinner and light music.

MUZAFFARNAGAR BRANCH—A meeting of the branch was held on 31-7-60. Major N. Tyagi presided. Besides routine work, methods to check quackery menace and to deal with chemists dispensing drugs other than prescribed, were discussed. Dr. S. C. Tyagi, Asst. Prof. of Pathology, Medical College, Patiala gave a talk on Virus, its property, role in human infection, immunity and antibiotic or/and chemotherapy treatment as it stands to-day.

NAVASARI BRANCH—A meeting of the Branch was held on 24-9-60. Office-bearers for 1960-61 were elected with Dr. R. G. Desai as President, Dr. (Smt.) R. D. Papadia as Vice-President, Dr. Babulal H. Shah as Secretary and Dr. R. C. Patel as Treasurer. A short discussion was held on Thyrotoxicosis in medical, surgical and obstetric aspects.

NIZAMABAD BRANCH—A clinical meeting was held on 28-8-60. The president of the branch Dr. Gulam Nabi demonstrated 3 cases of old Ruptured Ectopic operated successfully and one case of Strangulated Hernia with Gangrene operated successfully. Dr. Razzack demonstrated a case of Scurvy and a case of Tetanus neonatorum. Dr. Gulam Nabi entertained the members to dinner.

A general body meeting was held on 25-9-60 under the chairmanship of Dr. Md. Gulam Nabi, when the following office-bearers for 1960-61 were elected: President—Dr. Md. Gulam Nabi; Vice-President—Dr. Nadkarni; Hony. Secretary—Dr. A. A. Razzack; Jt. Secretary—Dr. D. Rama Rao; Treasurer—Dr. Subedar; Representative to Central Council—Dr. Williams.

Dr. Gulam Nabi demonstrated three cases: Filarial Scrotum in a Young Man; Sudden Massive Collapse in a Male; Cardiac Spasm of Oesophagus in a Middle-aged Female. Dr. Abdul Ali demonstrated two cases of Myxoedema in Middle-aged Females.

NORTH MALABAR BRANCH—A meeting was held on 31-7-60 with Dr. K. T. P. Nambiar in the chair. Condolence resolutions were adopted to mourn the deaths

of Dr. S. K. Raman, Dr. T. D. Nair and Dr. V. C. Nayamar. It was further resolved to request the Government of Kerala to separate the Medical and Public Health Departments, to raise the rates of fees admissible to government medical officers for the issue of certificates and bringing the pay scales for medical officers on a par with their counterparts in Madras State.

A special meeting was held on 27-8-60 with Dr. K. T. P. Nambiar in the chair. Dr. M. V. Chari of Mangalore gave an address on Civilisation and Disease. The Secretary appealed to the members to enrol new members.

Before the meeting started Dr. V. Narayanan was at Home to the members.

PARVATIPURAM BRANCH—At the general meeting held on 11-8-60 the following office-bearers were elected: President—Dr. C. Adinarayana Rao; Hony. Secretary and Treasurer—Dr. D. Venkoba Rao.

PILIBHIT BRANCH—At a meeting held on 22-9-60 the following office-bearers for 1960-61 were elected: President—Dr. R. C. Pandey; Vice-President—Dr. A. C. Agarwal; Secretary—Dr. C. L. Saxena; Jt. Secretary—Dr. S. P. Agarwal; Representative to Central Council—Dr. A. C. Agarwal.

The secretary reports that only four meetings could be held during the year.

PORBANDAR BRANCH—The annual meeting was held on 17-9-60. Thirteen members were present. The following office-bearers for 1960-61 were elected: President—Dr. H. H. Chavda; Vice-President—Dr. C. R. Shah; Hony. Secretary—Dr. B. D. Jhala; Hony. Jt. Secretary—Dr. R. R. Soneji; Hony. Treasurer—Dr. R. N. Maru; Representative to Central Council—Dr. P. M. Mehta. The accounts for 1959-60 and budget estimates for 1960-61 were presented.

Dr. Jhala requested members to give full co-operation to the triple-antigen vaccination campaign to be started by the City Municipality and to give injections on nominal remuneration. Members agreed to render all possible help. The meeting closed with a dinner.

PURI BRANCH—A meeting was held on 24-9-60 under the chairmanship of Dr. S. N. Acharya. Dr. Acharya read a paper on Tropical Eosinophilia. Most of the members took part in the discussion.

RAIGARH BRANCH—At a meeting held on 11-9-60, the following office-bearers for 1960-61 were elected: President—Dr. V. P. Sant; Secretary—Dr. S. K. Mitra; Jt. Secretary—Dr. J. B. Nande.

Rani Padmawati Devi, Minister for Public Health, Madhya Pradesh, was entertained at a dinner party in the local circuit house by members of the Branch.

RAIPUR BRANCH—A farewell dinner was given to Dr. R. K. Tiwari, ex-president of the branch, on 25-5-60.

A meeting was held on 27-6-60. Dr. R. S. Seth was elected President *vide* Dr R. K. Tiwari transferred. Dr. H. B. Lall took the chair.

At a meeting of the branch on 25-7-60, Dr. N. L. Kalle, CMO., Bhilai Steel Project, inaugurated the series of guest lectures—which also serve as a refresher course—to be held monthly. Dr. Kalle gave an interesting talk on Head Injuries—Their Management. Dr. R. S. Seth was in the chair. Local doctors and nursing staff attended.

On 29-8-60, Dr. G. P. Srivastava spoke on the Aetiology, Pathology and Clinical Features of Myocardial Infarctions.

The branch secretary reported that the membership has now risen from 28 to 47.

RAMANATHPURAM DISTRICT BRANCH-A meeting was held on 17-7-60. Dr. Raju Iyer presided. Dr. M. V. Bhat of Madurai spoke on Surgical complications of Amoebiasis. Election to central I.M.A. was held.

A meeting was held on 28-8-60. Dr. Raju Iyer presiding. Dr. B. S. Chellappa of Madurai spoke on Acute Perforations of the Stomach and Small Intestines. Dr. G. C. Ambunatham spoke on the Medical Aspects of Perforations of the Stomach and Small Intestines.

RAMGARH CANTT. BRANCH—At the annual general meeting held on 9-9-60, the following office-bearers were elected: President—Dr. D. C. Ray; Vice-President—Dr. S. R. Dhar; Secretary—Dr. A. Raha; Asst. Secretary and Treasurer—Dr. A. Sarkar.

The Secretary in his annual report stated that 10 meetings were held in the previous year and that the Bihar Health Week and the W.H.O. Day were observed. The members attended three refresher course lectures during the year.

REWA BRANCH—A general body meeting was held on 15-9-60. A resolution condoling the death of Dr. C. S. P. Chaturvedi was adopted. Later the following office-bearers for 1960-61 were elected: President—Dr. K. Y. Shrikhande; Vice-President—Dr. R. K. Singh; Hony. Secretary—Dr. R. C. Jain; Hony. Treasurer—Dr. Joshi; Representative to Central Council—Dr. N. Singh.

The outgoing Secretary presented the annual report for 1959-60. Monthly meetings had been regularly held. The annual day was celebrated with a variety entertainment, a picnic and a dinner. A banquet was arranged in honour of the visit of the M. P. State Branch President—Dr. G. S. Wagle on 15-2-60.

SAKRI BRANCH—A general meeting of the branch was held on 7-8-60. Dr. S. Bhattacharjee presided. It was resolved that Drs. K. L. Misra and K. N. Jha be included as members of this branch.

SHILLONG BRANCH—A general meeting was held on 6-8-60. Dr. S. Bhattacharya presided, 23 members were present. A resolution condoling the death of Dr. Lalit Kumar Barua of Nowgong on 24-6-60, Dr. Sudhir Ranjan Bhattacherjee of Shillong on 29-7-60 and Dr. Sudhir Chandra Bose of Calcutta on 3-8-60 was adopted.

Dr. Miss N. Chaliha gave a talk on her experiences during her recent tour to Vienna and the U.K.

The election of a president and three Vice-presidents to the Central Office were conducted.

The Executive Committee of the Branch at a meeting on 27-7-60 requested the State Branch to inquire into the loss and damage sustained by medical personnel of the State during the recent disturbances and further requested all members of all branches of I.M.A. to render all possible help to the affected medical personnel.

SHOLAPUR BRANCH—The following office-bearers for 1960-61 were elected at the annual general meeting held on 25-9-60: President—Dr. K. B. Antrolikar; Vice-President—Dr. (Mrs.) M. Shah; Hony. Secretary—Dr. B. S. Chavan; Hony. Jt. Secretary—Dr. M. V. Albal; Hony. Treasurer—Dr. M. P. Bawle; Representatives to Central Council—Dr. M. J. Chidgupkar (Sr.), Dr. G. G. Joag.

The annual report for 1959-60 states membership rose from 101 to 108. Twenty-nine meetings of various categories were held. The Republic Day and World Health Day were celebrated. Members attended several medical conferences and camps. The report speaks various other activities.

SIMRAHI BRANCH—The general meeting of the branch was held on 12-7-60. Dr. R. P. Singh presided. Six members were present. Office-bearers were elected with Dr. B. N. L. Das as President; Dr. P. K. Das as Vice-President; Dr. B. K. Sinha as Hony. Secretary; Dr. U. Jha as Joint Secretary; representative to State Council, Dr. B. K. Gupta; Auditor, Dr. R. P. Singh.

SITAMARI BRANCH—Health week was celebrated in Sitamari from 29-2-60 to 6-3-60. It was inaugurated by Sri B. M. Mishra, Principal, R. K. Goenka College, Sitamari on 29-2-60. Sri J. Jha presided. In his inaugural speech Sri Mishra stressed on the Role of Doctors in Public Health Programme. Sri Rajendra Singh gave a short talk on preventing aspects of various diseases. An exhibition was arranged by Dr. A. P.

Verma, Anti-Malaria Officer. A baby show was held on 1-3-60 and prizes were distributed to 3 babies.

During this week, meetings were held and talks were given on various subjects viz. family planning, role of general practitioners in the evolution of modern medicine, leprosy and preventive measure etc. Cultural shows and examination of school health were held. Vaccination of students of local school was done. On 6-3-60, a District Medical Conference was held. Seventy-eight doctors from the district participated in it. Srimati Rani Jyotirmoyee Devi, Dy. Health Minister inaugurated it. Dr. Lala Surajanandan Prasad, president of the State Branch presided. The Dy. Health Minister assured the members that the Government was aware of the difficulty faced by young doctors in rural areas and was contemplating to redress those difficulties. Dr. L. S. N. Prasad inter alia explained the aims and objects of IMA and services it has been rendering to the medical profession and appealed to all doctors to come in its fold as power lies in unity.

TIRUCHY BRANCH—A meeting was held on 6-8-60. Dr. R. Kalamegham was in the chair, 42 members being present. Tea was given by Drs. T. S. Balasubramanyam and K. P. Chidambaram. Elections were held for president and 3 vice-presidents of the Madras State Branch.

Dr. L. Sylvester gave a talk on Anomalies in the Acute Abdominal Catastrophes.

SOUTH RATNAGIRI BRANCH—The annual report of the branch for the year 1959-60 shows that eight meetings were held during the year. In the meetings interesting scientific subjects were discussed. Office-bearers for 1959-60 were elected on 8-11-59 with Dr. B. V. Mane as President, Dr. R. S. Seaton as Vice-President, Dr. V. K. Pandit as Hony. Treasurer and Dr. P. K. Ambika as Hony. Secretary.

UNNAO BRANCH—A meeting was held on 27-2-60. Dr. K. D. Jain presided. Eight members were present. The President spoke on primary health-units.

A meeting was held on 7-4-60, to observe the World Health Day. Officers of the medical department of the Government co-operated. Dr. K. D. Jain presided. Dr. Jain along with Dr. S. R. Chakravarty discussed Malaria Eradication. An one act play on malaria eradication was demonstrated by girls of Rani Laxmi Bai Kanya Vidya Mandir.

A clinical meeting was held on 27-4-60. Dr. K. D. Jain presided. Ten members were present. Dr. D. J. Srivastava showed an interesting case of Hydronephrosis. Dr. K. D. Jain showed a case of Amoebic Hepatitis of unusual origin and spoke about general fever.

World Red Cross Day was celebrated on 8-5-60. Dr. S. C. H. Zaidi presided. Dr. K. L. Sharma spoke about the working of Red Cross Society. The girl students of R. L. B. K. Vidya Mandar gave a demonstration of First Aid. Prizes were distributed to participants in the last WHO Day celebration.

A meeting was held on 25-6-60. Dr. K. D. Jain presided. Ten members were present. Dr. D. J. Srivastava spoke about the management of Loo-Heat Stroke.

UTTAR PRADESH STATE BRANCH—An emergent meeting of the Working Committee was held on 28-3-60 at Varanasi. Dr. Bhola Nath, President, was in the chair. Fourteen members were present.

At the outset the death of Dr. Lekhraj Singh (Aligarh), Dr. S. D. Agarwal (Muzaffarnagar) and Dr. G. P. Dasgupta (Varanasi) were condoled. After the proceedings of the last meeting had been confirmed, the President informed the house that the question of filing a writ against the imposition of Sales tax on prescriptions had been taken up by the Kanpur Branch and the branch had been authorised to file a writ. The U. P. State Branch would give all possible assistance to the branch. Rs. 500/- was sanctioned towards expenses incurred in this connection by the Kanpur branch. The State Secretary was requested to appeal to all local branches for raising funds.

The following were declared elected: President—Dr. B. N. Bhallay, Kanpur; Vice-Presidents—Dr. H. S. Pant, Moradabad, Dr. Mohan Lal, Aligarh and Dr. K. K. Varma, Jaunpur.

The half-yearly accounts were adopted subject to audit. The programme of the Silver Jubilee session, the 30th U. P. State Medical Conference to be held at Varanasi for October 22 was adopted.

VARANASI BRANCH—In a meeting the members of the branch condoled the death of Dr. G. P. Dasgupta, a respected member of the branch.

A meeting was held on 23-9-60, to express grief over the sad and premature death of Dr. V. S. Chaturvedi, a popular practitioner of Varanasi and a resolution condoling his death was adopted.

XXX PUNJAB STATE MEDICAL CONFERENCE, 1960, SIMLA

The 30th Punjab Medical Conference which was to be held at Simla on the 29th and 30th October, 1960 has been postponed by two weeks. It will now be held on the 12th and 13th of November, 1960 in the Lady Chelmsford Hall (adjoining Ripon Hospital). S. Partap Singh Kairan, Chief Minister, Punjab is expected to inaugurate the Conference. The Scientific Session will deal with Emergencies in General Practice, covering all the branches, medicine, surgery, gynaecology, etc.

VII BOMBAY TERRITORIAL CONFERENCE, 1960, BOMBAY

The 7th Bombay Territorial Conference under the auspices of the Bombay Territorial Branch I.M.A. will be held at the Taj Mahal Hotel on November 26-27, 1960. All members of the I.M.A. are invited to attend the Conference. Details may be had from Dr. C. L. Jhaveri, Dr. R. K. Menda and Dr. K. K. Datey, the Hony. Organising Secretaries of the Conference, Shri Nivas, Sardar Vallabhbhai Patel Road, Bombay-4.

V RAJASTHAN PROVINCIAL MEDICAL CONFERENCE, 1960, KOTAH

The 5th Rajasthan Provincial Medical Conference will be held on November 27-29 at M. B. S. Hospital, Kotah. Dr. Jai Deo Prasad has been elected Chairman of the Reception Committee and Dr. D. L. Chhangani, the Organising Secretary for the Conference. Dr. B. N. Sharma, Director of Medical and Health Services, Government of Rajasthan will preside over it. His Highness Maharao Bhim Singh Ji of Kotah has kindly agreed to inaugurate the Conference on 27th November, 1960.

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** Food Science, 9 (10), 261; Indian Journal of Pediatrics, 27, (139), 399*

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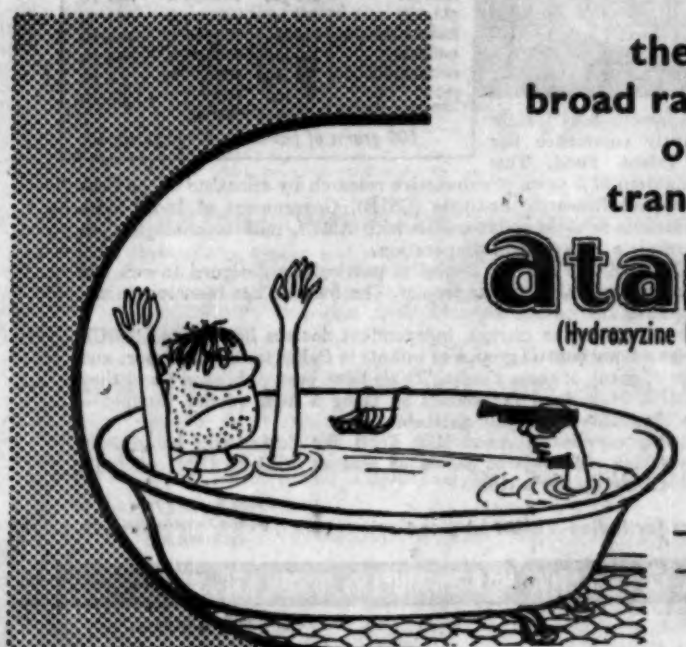

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HORDER

People are conservative. They like what they are used to. Sometimes this protects them from cheap and nasty innovations. Sometimes it leads them to a blind resistance to change. The great discoveries of Lister and Semmelweiss and Simpson all met with unreasoning opposition even from scientists.

A notable example of unreasoning conservatism is the prejudice that many people have against all things factory-made. No valid explanation can be offered, especially when one considers that most synthetically manufactured drugs and hormones available today are an improvement on the natural forms; in fact, most of them are cheaper, more effective, more easily standardized and without many of the untoward reactions observed in their 'natural' counterparts. Most illnesses today are treated with such drugs — and with excellent results!

Yet on a subject as vital as Nutrition, we find that there are people, even doctors, who are guided more by old beliefs than scientifically established fact. Hydrogenated fats suffer greatly from such beliefs. It is believed, for instance, that they are inferior to animal fats when used as a cooking medium. Yet numerous workers in this and other countries have concluded that hydrogenated fats are as good as animal fats for cooking, if not better.

Research studies in Europe and the US show that the basic energy and food value of hydrogenated oils is the same as that of the oils from which they are prepared. In the case of DALDA, the leading brand of vanaspati, this means primarily groundnut and til oils — both of which have a long record of excellence as a cooking medium.

These researches also indicate that, as a source of fat, hydrogenated oils like DALDA are equal to butter. Dr. Aykroyd, the former Director of Nutrition Research Laboratories, Coonoor, says: 'Vanaspati is a wholesome food and there is no objection from the nutritional standpoint to an increase in its consumption.'

In the USA, H. J. Deuel has found that products like DALDA, which are made of hydrogenated oils (95% of the oil in DALDA is partially hydrogenated), are digested and absorbed just as well as butter fat. Langworthy, also in the United States, has proved that the digestibility coefficients of vegetable oils hardened up to a melting point as high as 45° C are as good in humans as those of butter fat. And the melting point of DALDA is never above 37° C — which coincides optimally with body temperature.

DALDA has moreover one great advantage over the oils from which it is made. It is an excellent source of vitamins. Seven hundred International Units of Vitamin A, nearly one quarter of an adult's daily requirement, go into every ounce. And it is well known how deficient the Indian diet is in this vitamin. Besides this, 56 IU of Vitamin D are also added. In normal cooking, these vitamins are well retained, though if subjected to great heat for a long time, they will be lost from DALDA as from any other food.

There is a final point worth remembering. A great deal of medical research has been conducted on the subject of the causation of atherosclerosis and coronary and cerebral thrombosis. Excessive fat intake and faulty fat metabolism have been blamed by some people as factors causing these conditions in later life. Nobody yet knows how true this is. What we do know is that cholesterol when raised in a person's blood (serum) and when raised for a long period of time is definitely incriminated in the pathogenesis of atherosclerosis. Thyroid disorders, diabetes etc are diseases of the human which are characterized by raised serum cholesterol levels in the blood. Atherosclerosis is a very frequent accompanying complication of such diseases.

Much more knowledge is needed, and we welcome, therefore, the Government's announcement that the Indian Council of Medical Research is making investigations to try and establish the facts.

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